Hydraulic Reservoir Solutions

Co-Polymer and Steel Reservoirs

Co-Polymer & Steel Reservoirs

Features & Benefits

Parker hydraulic tank solutions are applied to a wide variety of markets

Hyd. & lube oil filtration	Co-polymer tanks	Steel tanks
Agriculture	X	X
Construction equipment	X	X
Marine		X
Material handling	X	
Mining		X
Road building equipment	X	X
Transportation	X	X
Waste management / Environmental control	X	X

An introduction to Parker Hydraulic Reservoir Solutions
Parker's experience in designing fluid power equipment will help a system designer to save costs at every stage of hydraulic system development.

Co-polymer tank example

Original Equipment Manufacturers are continually looking to reduce manufacturing costs and increase operating efficiency and it's here that Parker Hannifin's European Filtration Division offers complete solutions. Beside high quality steel tanks designed and supplied by Parker and featured in this brochure, Parker also designs and supplies revolutionary, lightweight co-polymer reservoirs with tank top mounted or integrated filter and tank air filter options.

Both tank types can typically represent a significant contribution to cost savings. Because of the differing features and benefits between the metal and co-polymer tanks, Parker is able to offer customers the most appropriate tank concept to meet their specific requirements.

Saving costs with complete Parker Hydraulic Tank Solutions

- A partnership in supply chain management reduces costs
- An integration of reservoir functions
- Reduction of component parts
- Integrated hydraulic filter and air filter benefits
- Integrated oil level measurement benefits
- Standard & customised solutions offered
- Flexibility related to shape & dimension of each tank
- Leak-proof connections
- Patented element for guaranteed quality filtration

Steel tank example

Typical Applications

Unique tank solutions designed to meet customer needs
Parker designs and supplies both co-polymer and steel reservoirs.

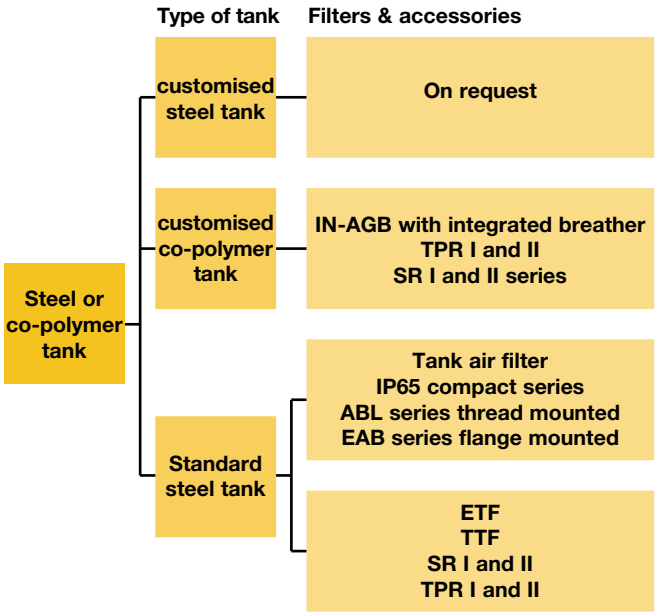
Today Parker steel tank solutions are typically applied to commercial vehicle applications for example waste management and the transportation market. Customers manufacturing hook-arm systems, truck manufacturing or vehicle body builders are further examples of potential customers for a complete steel tank assembly.

A more common use of co-polymer tanks can be seen in materials handling equipment, agricultural and construction equipment markets. Typical applications are warehouse trucks, smaller sized wheeled loaders, telescopic handlers, dumpers, mini excavators and agricultural machinery.

with the courtesy of Grove

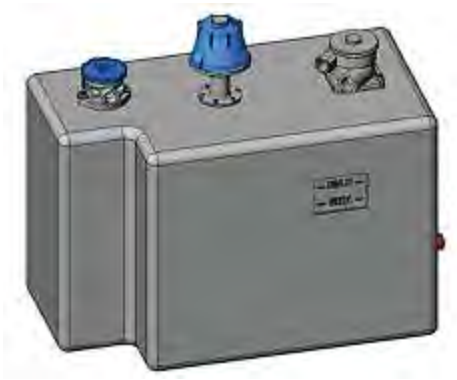
Specifications

Product Architecture



Co-polymer tank with integrated filter & air filter

Steel tank with integrated options



Example of co-polymer tank with top mounted filters and air filters

Design aspects	Co-polymer reservoir	Steel reservoir
Complicated shapes	X	
Styling of reservoir meets overall styling of vehicle	X	
Weight reduction	X	
Long-term temperatures Tmin< -30°C or Tmax> +120°C	(depends of material properties)	X
High mechanical load on tank (tank contributes to strength of chassis)		X
All-in-one concept	X	
High level of tank Pressurisation		X
Suitable for heavy duty equipment	X	X

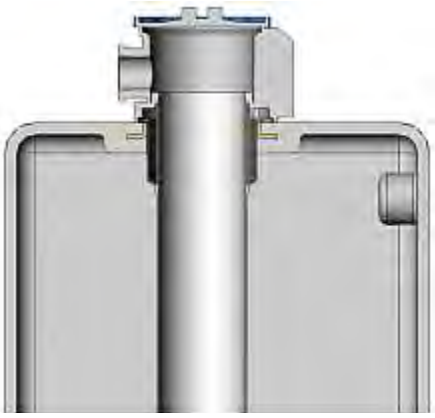
Design note: All customised tanks are engineered solutions based on detailed analysis of customer requirements and specifications. Detailed knowledge of co-polymer materials, implies that customised materials can be made available to meet specific demands. Depending on technical and commercial requirements, Parker is able to advise each customer individually, about the most suitable and economical reservoir solution, made from co-polymer or steel.

Co-Polymer Reservoirs

Features, Benefits & Specifications

Where a tailormade tank design is the solution
The lightweight co-polymer tank is an all-in-one solution that keeps in mind a customer's specific design requirements. Each tank is unique in terms of shape, dimensions and integrated functions. It is equipped with an integrated tank top mounted return line filter and tank air filter. All filters and air filters are supplied as standard with the patented, environmentally friendly *LEIF*® element.

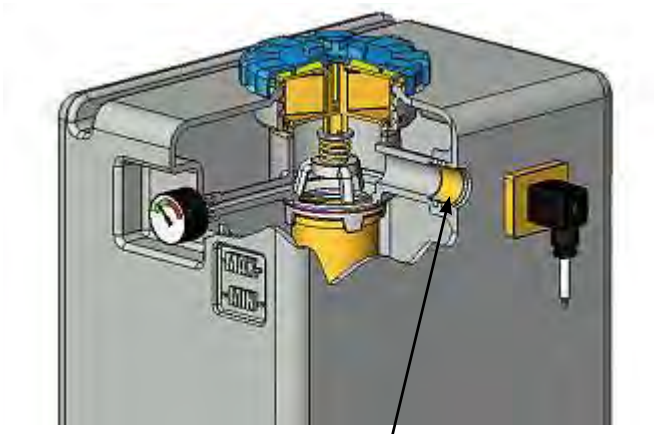
Reliable connections
Reliable, leak-proof connections have always been a critical aspect for co-polymer tanks. Parker has developed a technology using metal attachment components. All metal attachment components are moulded in with the co-polymer tank wall, ensuring a reliable, leak-proof connection between the tank and the components that are attached to it.



Parker Filtration has designed high tech sealing solutions for tank top mounted filters.

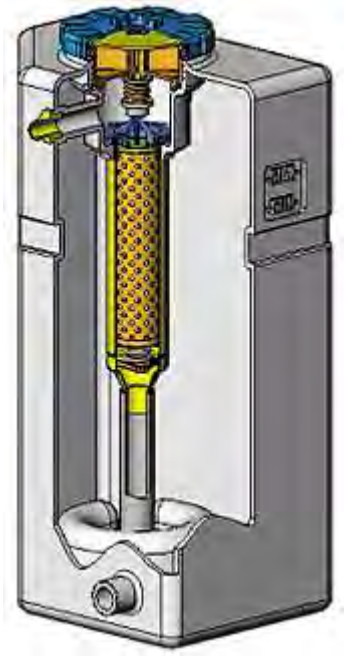
These attached connections (e.g. a suction connection for pumps, drains, vents, or a filler opening) can easily be achieved, as well as providing indications for minimum and maximum oil levels. Metal attachment connections can be made available for hose couplings, a flange attachment or thread attachment.

Co-polymer reservoirs are designed to meet the stringent demands of our customers. All relevant aspects are analysed, from material properties and operational conditions to dynamic load and requirements for equipment servicing.

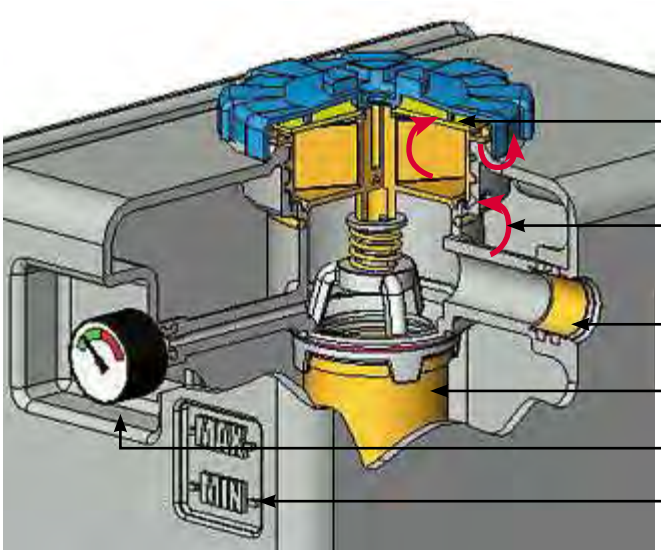


Customised integrated metal attachment
"Tank also features integrated level measurement"

Level measurement
Oil level indication can be fully integrated into the tank design. This feature eliminates the need for level glasses, which are fragile and an additional potential source of leakage when mounted incorrectly.



Example of customised co-polymer tank



Integrated air breather
(with optional water removal media)

Air flow through air breather labyrinth

Return line connection

Integrated return line filter type IN-AGB filter has
In-to-Out flow direction

Pressure gauge or switch

Oil level indication

Example of a customised tank with an integrated return line filter and air filter

The ultimate all-in-one design
A more frequent use of co-polymer tanks located on the outside of mobile equipment often results in specific requirements relating to styling.

Despite the compact design of Parker tank top mounted filters and air filters, these parts can influence aspects related to styling or cabin accessibility.

This concept is ideal for applications where space is at a premium.

Parker Filtration's unique all-in-one design, where the return line filter and air filter are both located under one cover is a concept that offers great possibilities related to tank styling. The high quality of the co-polymer material ensures a long-term stability of the chosen colour.

This all-in-one design features the IN-AGB type return line and integrated air filter with labyrinth. The labyrinth prevents oil leakage through the air filter. The connection(s) for return line(s) and filler port are integrated in the tank. This avoids having to have hydraulic hoses placed on top of the tank.

Environmentally friendly
Parker considers care for the environment as a social obligation. The environmentally friendly *LEIF*® element (Low Environmental Impact Filter) is applied to the return line filters and breathers type ABL and EAB.

What makes this element so special is that the metal sleeve can be re-used. As a result, this filter element component no longer ends up in the waste disposal; only the contaminated filter medium is disposed of as chemical waste. With *LEIF*® filter elements, the disposal and processing cost may be reduced by as much as 50%.

The *LEIF*® concept safeguards the use of genuine Parker parts.

***LEIF*® elements:**
- Environmentally friendly filtration
- Re-usable steel element sleeve
- Patented elements result in guaranteed quality of filtration
- Saves element disposal costs typically by up to 50%
- Supports ISO 14001 certification

IN-AGB with LEIF® element

Cost-effective
The advantages of this co-polymer concept are obvious:

- Lightweight
- Flexibility with respect to tank shapes
- Characteristics of plastic material can be customised to meet specific requirements
- Integration of several functions limits the use of individual components
- The tank can be purchased and supplied as a complete unit

Steel Reservoirs

Features, Benefits & Specifications

Parker steel reservoirs designed to withstand extreme conditions
Standard steel tanks are often specified for commercial vehicle side mounting. Parker steel tanks are built to last in extreme conditions. Extreme weather conditions and heavy duty vehicle movements can be resisted by our tank design.

Quality design
As with co-polymer tanks, steel tanks offer leak proof connections and are vigorously tested against leakage. Additionally, they are painted with primer and topcoat to ensure maximum protection against corrosion.

Steel tank with Tanktopper II filter

- Dirt, water, snow and ice will not adhere to the tank surface next to the breather and filter

Suction port(s), covered with anti-vortex plate(s), allow low oil levels giving the operator an increased operational capacity. Before delivery the steel tanks are thoroughly washed inside and ready for system assembly.

Diverse tank size options are available
With space at a premium in most truck chassis configurations and the need to deal with toolboxes, compressed air reservoirs and other equipment, tank dimensions are always an issue. To meet the specific environment requirements Parker Filtration offers several tank sizes.

Steel tanks are fully equipped. Our customers can choose from a wide choice of filter options. Parker considers care for the environment. The environmentally friendly *LEIF*® element is also applied to steel tank solutions. Additionally, Parker steel reservoirs are equipped with an efficient air filter, a level gauge, plugs, a suction kit and mounting brackets. The level gauge can be re-located on the other side of the tank if user visibility is an issue.

Technical data steel tanks
Material: 2mm steel plate applied for standard reservoirs

Suction connection: Suction connections at the back and the bottom of the tank swivel type nominal size 2", 2½" and 3".

Air filter: Ref. product selection for types:
IP65
ABL
EAB

Tank top mounted return filter
TTF
ETF
Tanktopper I & II (with integrated air breather)
SR series (Suction & Return filters)

Support frame and fasteners
Included as standard
Holes must be drilled into the plate 160 x 280mm for attachment to the frame for standard steel reservoir

Steel tank with with customised chassis mounting straps

Detailed sectional view of Tanktopper II with integrated air filter

Ordering Information

Product configurator

Configurator examples SR filter

Box 1	Box 2	Box 3	Box 4	Box 5	Box 6	Box 7
S	**075**	**R**	**S**	**TTF3**	**10QI**	**E10**

Box 1

Tank type	
Material	**Code**
Steel (standard tank shape)	S
Steel (customised tank design)	on request
Aluminium (customised tank design)	on request
Co-polymer (customised tank design)	on request

Box 2

Tank volume			
Operating volume (L)	**Gross volume (L)**	**H x D x W**	**Code**
70	89	500 x 650 x 300	075
90	113	500 x 650 x 425	100
125	163	500 x 650 x 620	150
160	208	500 x 650 x 795	200
215	275	500 x 650 x 975	250

Box 3

Level glass	
Location	**Code**
Right hand side	R
Left hand side	L

Box 4

Suction port options	
Suction port connections	**Code**
Swivel type 42mm (nominal 2")	N (on request)
Swivel type 55mm (nominal 2 ½")	W (on request)
Swivel type SAE 3"	S (standard)
G2" - Female BSP (ISO 228)	on request
G2 ½" - Female BSP (ISO 228)	on request
G2" - Female ball valve (manual operated)	on request
G2 ½" - Female ball valve (manual operated)	on request

Box 5 Box 6

Filter model Other filter sizes are available				
Filter	**Qmax**	**Code**	**Recommended tank size**	**Media code**
ETF310QBP2FG164	90	ETF3	Code 075 and 100	10Q
TTF310QLBP2EG121	90	TTF3	Code 075 and 100	10QL
TTF610QLBP2EG203	170	TTF6	Code 150 and larger	10QL
TPR210QLBP2EG12L	80	TPR2	Code 075 and 100	10QL
TPR710QLBP2E2G241	250	TPR7	Code 150 and larger	10QL
SRL1210QLBPGG161	130	SRL1	Code 075 and 100	10QL
SRL2210QLBPGG201	250	SRL2	Code 150 and larger	10QL

Note: Refer to the relevant product information to compose the required filter configuration.

Box 7

Tank air filter	
Breather type	**Code**
IP65 Breather (AB98610101)	IP65
Flange mounted style (compact design)	
EAB10 (EAB10P020HC73)	E10
EAB20 (EAB20P020HC73)	E20
Anti splash style filter (threaded connection)	
ABL1 ABL1G114QXWL3)	ABL1
ABL2 (ABL2G114QXWL13V)	ABL2

Note: filter codes are based on B(c)10≥200 glass fibre elements other degrees of filtration are standard available.

Degree of filtration						Media code
Average filtration beta ratio ß (ISO 16889) / particle size µm [c]						
ßx(c)=2	**ßx(c)=10**	**ßx(c)=75**	**ßx(c)=100**	**ßx(c)=200**	**ßx(c)=1000**	
% efficiency, based on the above beta ratio (ßx)						
50.0%	**90.0%**	**98.7%**	**99.0%**	**99.5%**	**99.9%**	
N/A	N/A	N/A	N/A	N/A	4.5	**02Q/02QL**
N/A	N/A	4.5	5	6	7	**05Q/05QL**
N/A	6	8.5	9	10	12	**10Q/10QL**
6	11	17	18	20	22	**20Q/20QL**

Highlights Key (Denotes part number availability)

123	Item is standard
123	Item is standard green option
123	Item is semi standard
123	Item is non standard

Note: Standard items are in stock, semi standard items are available within four weeks

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Notes

Environmental Air Filters

EAB Series

Typical Applications

- Agricultural machines
- Articulated dump trucks
- Forestry equipment
- Wheeled loaders
- Lubricating systems
- Excavators
- Mobile cranes
- Industrial power units

Technical Data

The filter has been designed to achieve a low pressure drop and high dirt holding capacity with airflows up to 1500 l/min. A compact EAB10 with airflows up to 1000 l/min is also available.

Construction:
Glass reinforced composite housing with Eco-element.

Filter media options:
P020: High quality polyester media. 2µm (abs).
C015: Polyester media with water-resistant layer. 1.5µm (abs)
Q010: Glass fibre media. 1.0µm (abs)

Mounting options:
With 6 screws. Includes machine and plate screws, a strainer and gaskets.
External threads G3/4", G1".
Internal thread G3/4".

Options:
Visual gauge type vacuum/pressure indicator.
Overpressure valve, pressure setting 0.2 bar.
EAB10 cannot be specified with an overpressure valve and vacuum/ pressure gauge at the same time.

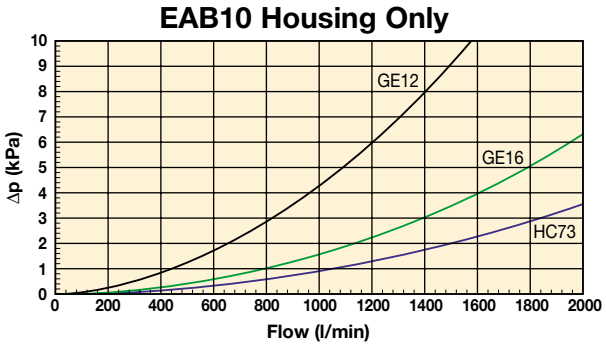
Advantages of the EAB filters:
Easy maintenance.
Indicator states the need for element change.
Quick and easy element change (no tools required).

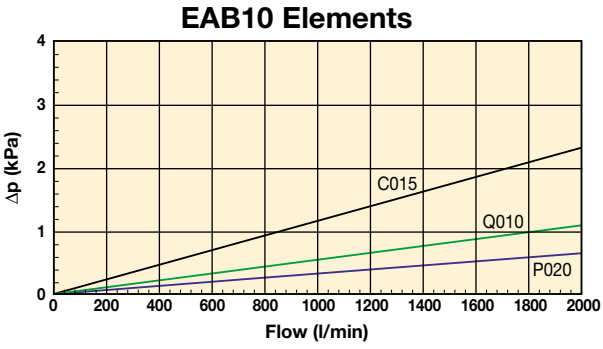
Environmentally friendly:
EAB elements contains no metal parts: therefore it can be crushed and burned minimising the volume of waste material.

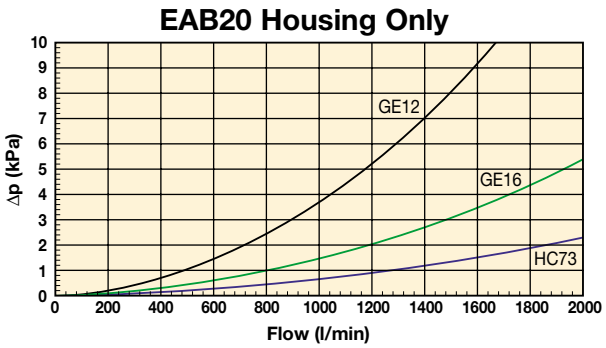
Other features:
The optional indicator is located in a safe place inside the housing. Housing includes mounting holes for a padlock, which allows you to increase the security against theft and vandalism.

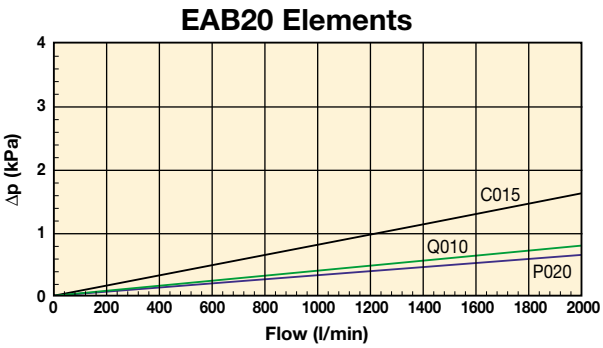
Pressure Drop Curves

Δp total = Δp housing + Δp element. The recommended level of the initial pressure drop for this filter is max 0.02 bar (2.0 kPa).



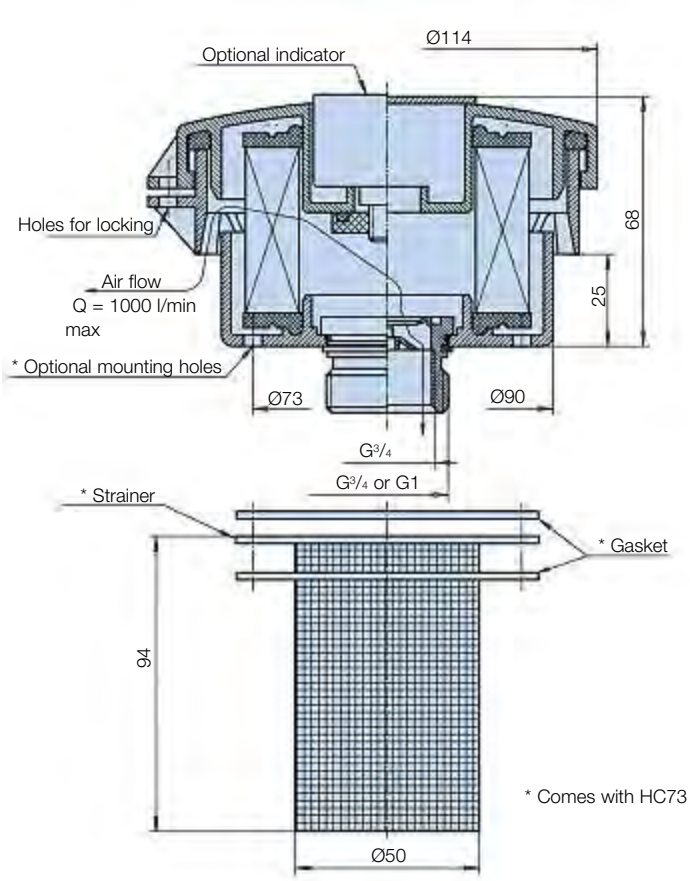




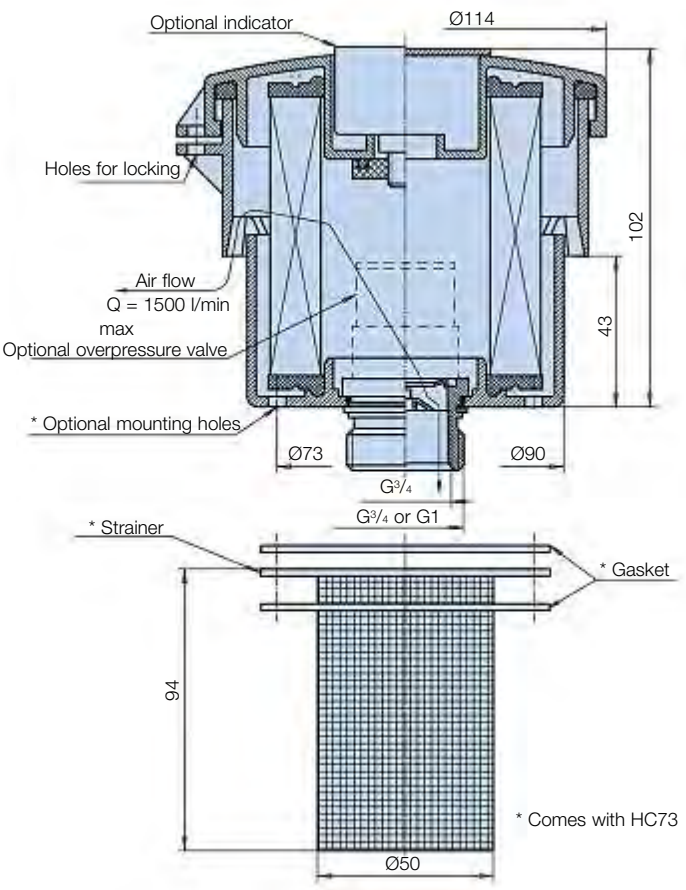


Specification

EAB10

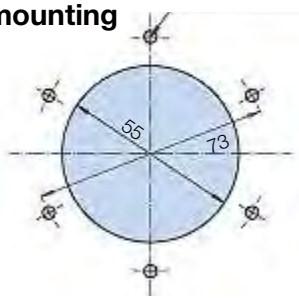


EAB20



NOTICE!
Air filters are an essential part of the system and the element needs to be replaced regularly.

6 hole fixing mounting dimensions



Mounting	Code
6 mounting holes	HC73
G1 external	GE16
G¾ external	GE12
G¾ internal	GS12

EAB Series

Ordering Information

Standard products table

Part number	Supersedes	Model	Media	Mounting	Overpressure valve	Indicator	Replacement elements
EAB20P020HC73V2	EAB20P020HC73-V2	EAB20	P020	HC73	V2		**EAC20P020**
EAB10P020HC73	N/A	EAB10	P020	HC73			**EAC10P020**
EAB20P020HC73	N/A	EAB20	P020	HC73			**EAC20P020**
EAB20P020GE16	N/A	EAB20	P020	GE16			**EAC20P020**
EAB20P020HC73A	EAB20P020HC73-A	EAB20	P020	HC73		A	**EAC20P020**

Product configurator

Product number	Media options		Mounting options		Overpressure valve options		Indicator options	
EAB20	**P020**	2µ abs polyester	**HC73**	6 hole fixing		No overpressure valve		No indicator
EAB10	**C015**	1.5µ abs water resistant	GE12	G¾ external thread	V2	0.2 bar	A	Vacuum/pressure gauge
	Q010	1.0µ abs glass fibre	**GE16**	G1 external thread G¾ internal				
			GS12	thread M33 x 2 external				
			ME33	thread				

Replacement elements

Product number	Media options	
EAC20	**P020**	2µ abs polyester
EAC10	**C015**	1.5µ abs water resistant
	Q010	1.0µ abs glass fibre

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: For alternative part number options, consult Parker Filtration.

ABL Series

Typical Applications

The Parker Filtration ABL-1 and ABL-2 Series Air Filters.

- Saw mills
- Agricultural machines
- Articulated dump trucks
- Forestry equipment
- Wheeled loaders
- Lubricating systems
- Excavators
- Industrial power units
- Mobile cranes

Technical Data

Assembly:
Tank top mounted.

Connections:
Threads G1¼ (ISO 228), 1½" (UN-16-2B).

Seal material:
Seals integrated in *LEIF*® element.

Operating temperature range:
-20° to +80°C.

Filtration media:
3 micron.

Flow fatigue characteristics:
Filter media is supported so that the optimal fatigue life is achieved.

Vacuum indicator:
ABL-1 on request only, ABL-2 0.04 bar. Visual with latch out memory.

Breather housing:
High impact strength composite.

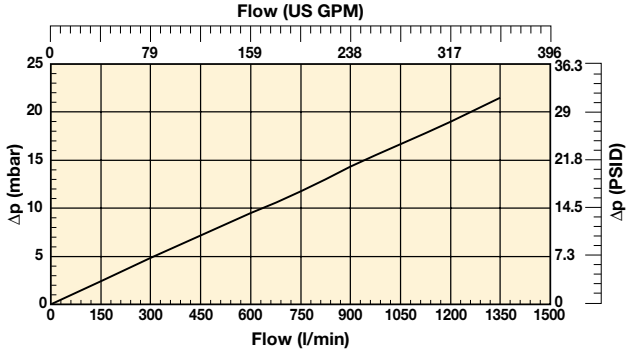
Filter element:
LEIF® element.

Options:
- Adaptor with filter connection.
- Single adaptor.
- Breather with integrated pressure relieve valve for pressurised tank on request only.

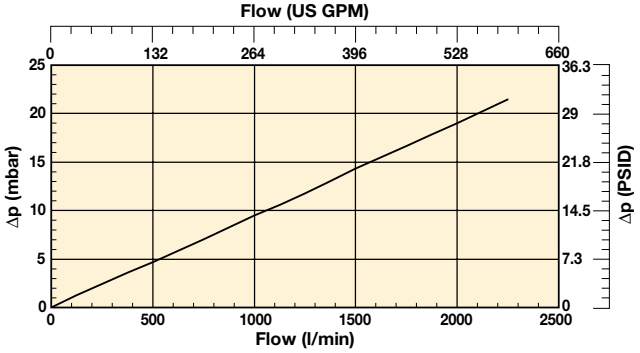
LEIF® elements can be used for hydraulic fluids and HEES type fluids only. For other fluids contact Parker Filtration.

Pressure Drop Curves

ABL1



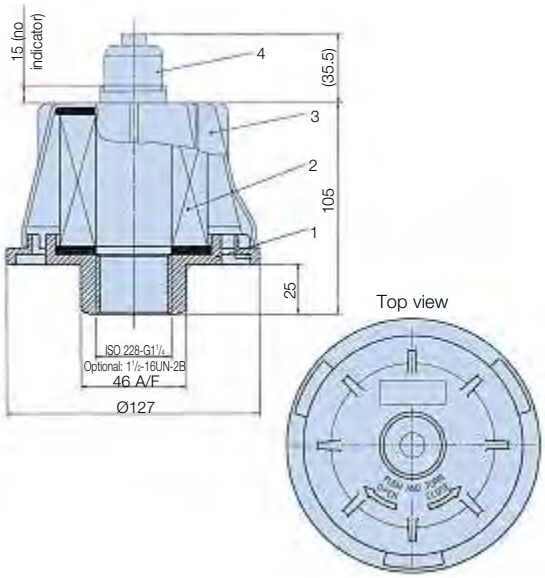
ABL2



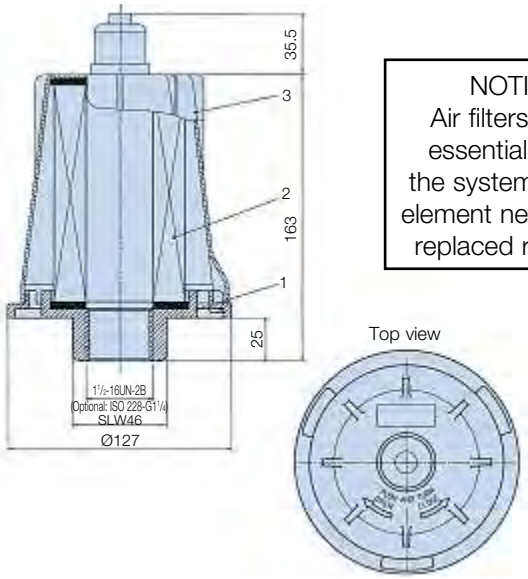
ABL Series

Specification

ABL-1



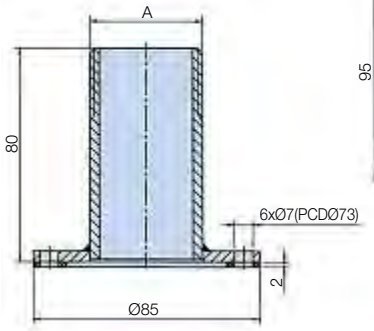
ABL-2



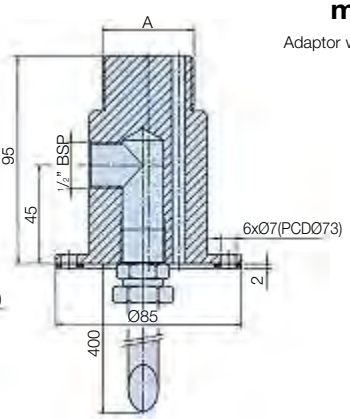
NOTICE!
Air filters are an essential part of the system and the element needs to be replaced regularly.

Extensions and filling mounting adaptors

Adaptor single



Adaptor with filler connection



Ordering Information

Standard products table

Part number	Supersedes	Replacement elements
ABL1G114QXWL3	ABL1-G1¼-QXWL-3	**QXWL3**
ABL2G114QXWL13V	ABL2-G1¼-QXWL-1-3-V	**QXWL13**
ABL2U112QXWL13V	ABL2-U1½-QXWL-1-3-V	**QXWL13**
ADAPTORABLG114FP	ADAPTOR-ABL-G1¼-FP	**-**

Product configurator

Product number		Mounting options		Filtration (3µm)		Indicators		Options	
ABL1	1000 l/min	**G114**	ISO 228 - G1¼ (BSP)	**QXWL3**	ABL1 Only		None		None
ABL2	2000 l/min	**U112**	1½ UN-16-2B	**QXWL13**	ABL2 Only	**V**	Visual	SNG	Vacuum/Pressure Gauge
								FP	Adaptor With Filler Connection

Product configurator

Product number	Mounting options		Options	
Adaptor ABL	**G114**	ISO 228 - G1¼ (BSP)	**SNG**	Single Adaptor
	U112	1½ UN-16-2B	**FP**	Adaptor With Filler Connection

Replacement elements

Part number	Supersedes	Description
QXWL3	QXWL-3	3µ
QXWL13	QXWL1-3	3µ

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Notes

Glass-Filled Nylon and Metal Breathers

IP65 Rated, Metal, Screw-on and Lockables

IP65 Rated Filler Breathers

Specification for Single and 6 Hole Installation

Option 1

Construction:
Moulded in non-corrodible glass-filled nylon combining strength with a lightweight design.

Options:
(1) single (63mm dia) hole
Filler breather installation that eliminates drilled and tapped holes using self-locking clamps.
(2) 6 hole
Filler Breather Installation that uses 6 x No 10 thread forming screws.
(3) 3 hole filler breather
utilises 3 x zinc and clear chromate plated steel screws.

Strainers:
Unique design diffuses oil flow into the reservoir.
(1) Single length in polypropylene (95mm length)
(2) 2-piece telescopic in polypropylene (195mm length max.)

Filtration element:
Expanded polyurethane foam, 10 micron nominal.

Seals:
Nitrile.

Working temperature:
-30°C to +90°C.

Pressurised filler breathers:
Available in 3 pressure options to maintain a positive pressure in a reservoir.

Pressurisation options:
0.2, 0.35 and 0.7 bar crack pressure.

Pressurisation valve:
Nylon/Nitrile.

Dipstick:
Available for use with options 1 and 2. Dipsticks are available in 2 lengths and in packs of 10.

Dipstick material:
ABS.

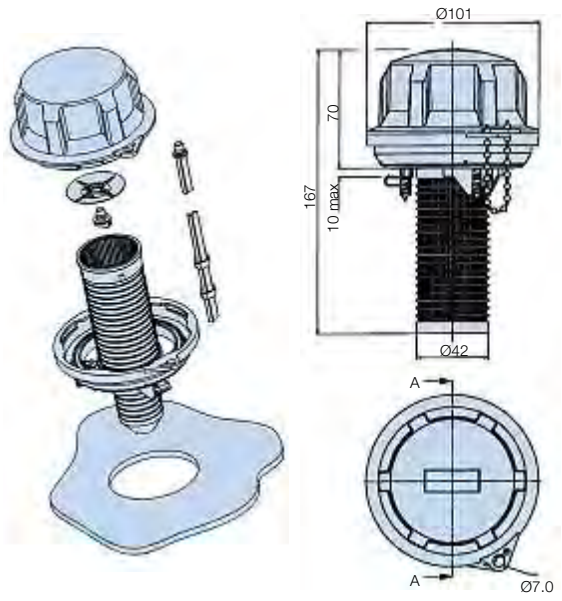
Hi/Lo indicators:
Acetal. Adjustable Red/Green level indicators.

Dipstick lengths:
200mm and 400mm.

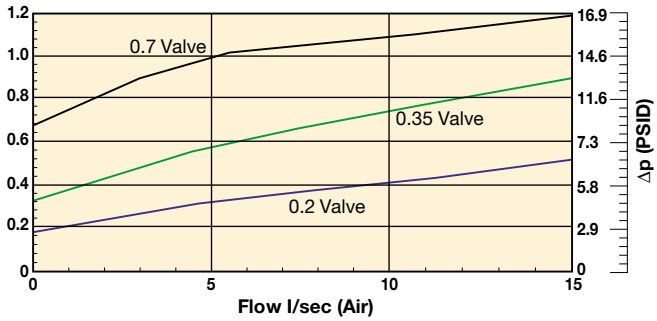
Breather weight:
0.2Kg.

Anti-splash feature:
The unique design anti-splash feature is standard on all options 1 and 2 and allows for a dipstick to be fitted if required.

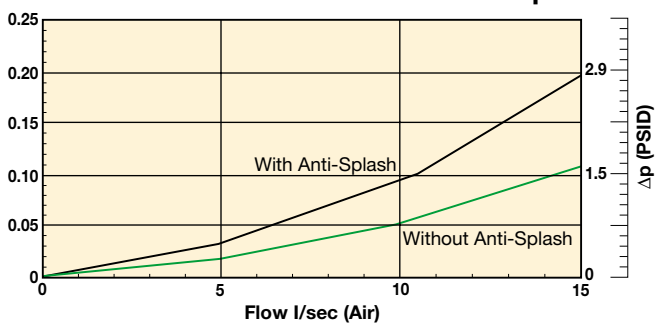
Option 1 Filler Breathers (Single Hole Installation)



AB98XXX Pressurised Pressure Drop Curves



AB98XXX Non-Pressurised Pressure Drop Curves



Option 1. Single Hole Filler Breathers – Pressurised

Part number	Supersedes	Description 10µ nom
AB98212011	AB.98212011.UC	Pressurised 0.2bar with 95mm strainer
AB98213011	AB.98213011.UC	Pressurised 0.35bar with 95mm strainer
AB98212001	AB.98212001.UC	Pressurised 0.2bar without strainer
AB98212021	AB.98212021.UC	Pressurised 0.2bar with telescopic strainer
AB98213001	AB.98213001.UC	Pressurised 0.35bar without strainer
AB98213021	AB.98213021.UC	Pressurised 0.35bar with telescopic strainer
AB98217001	AB.98217001.UC	Pressurised 0.7bar without strainer
AB98217011	AB.98217011.UC	Pressurised 0.7bar with 95mm strainer
AB98217021	AB.98217021.UC	Pressurised 0.7bar with telescopic strainer

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Option 1. Single Hole Filler Breathers – Non-Pressurised

Part number	Supersedes	Description 10µ nom
AB98210011	AB.98210011.UC	Filler breather with 95mm strainer
AB98210021	AB.98210021.UC	Filler breather with telescopic strainer
AB98210001	AB.98210001.UC	Filler breather without strainer

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Option 2

Note 1. Un-pressurised 6 hole fixing:

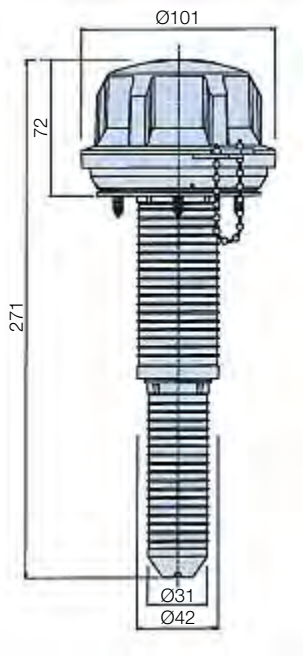
Form 6 off tank mounting holes between Ø4.0 and 4.4mm (dependent on the material and thickness – see guide below) equispaced on 70-73mm P.C.D. to suit supplied No.10 thread forming screws.

Note 2. Pressurised 6-hole fixing:

Form 6 off tank mounting holes between Ø4.0 and Ø4.4mm (dependent on the material and thickness – see guide below) equispaced on 73mm P.C.D. to suit supplied No.10 thread forming screws.

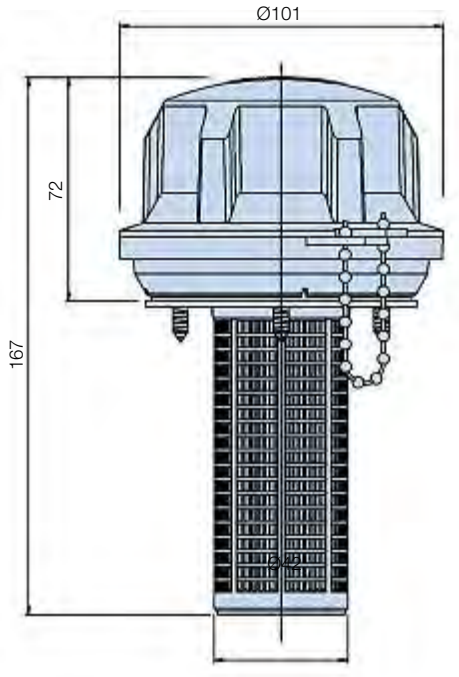
Note 3. Reservoir mounting guide

Sheet thickness mm	Hole size mm
1.2	4.0
2.0	4.10
3.15	4.30
4.0	4.30
5.0	4.40



Telescopic Strainer

The telescopic strainer design is ideal, where reservoir depth allows, to increase the surface area of the strainer, improving still further its straining ability, oil flow-through and allowing for longer dipstick lengths.



Option 2. 6 Hole Filler Breathers – Pressurised

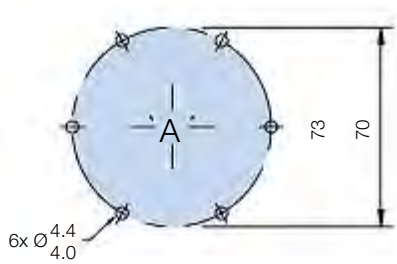
Part number	Supersedes	Description 10µ nom
AB98817011	AB.98817011.UC	Pressurised 0.7bar with 95mm strainer
AB98812001	AB.98812001.UC	Pressurised 0.2bar without strainer
AB98812011	AB.98812011.UC	Pressurised 0.2bar with 95mm strainer
AB98812021	AB.98812021.UC	Pressurised 0.2bar with telescopic strainer
AB98813001	AB.98813001.UC	Pressurised 0.35bar without strainer
AB98813011	AB.98813011.UC	Pressurised 0.35bar with 95mm strainer
AB98813021	AB.98813021.UC	Pressurised 0.35bar with telescopic strainer
AB98817001	AB.98817001.UC	Pressurised 0.7bar without strainer
AB98817021	AB.98817021.UC	Pressurised 0.7bar with telescopic strainer

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Option 2. 6 Hole Filler Breathers – Non-Pressurised

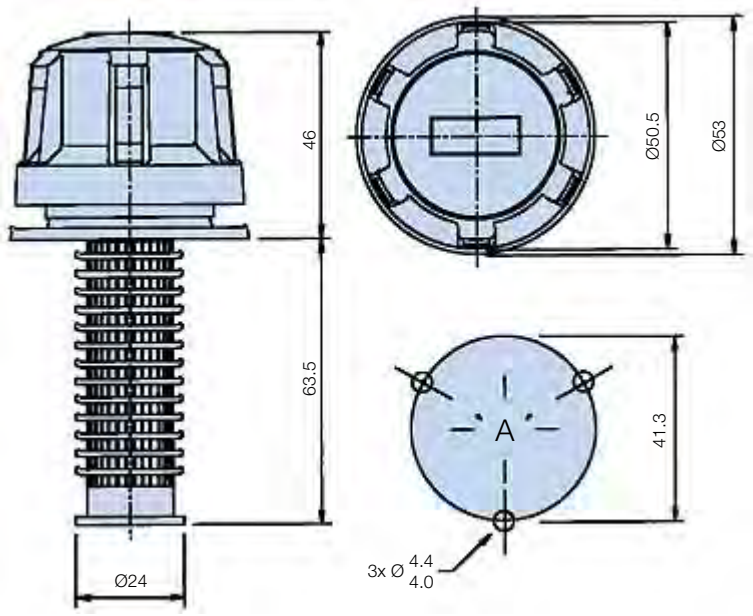
Part number	Supersedes	Description 10µ nom
AB98810001	AB.98810001.UC	Filler breather without strainer
AB98810011	AB.98810011.UC	Filler breather with 95mm strainer
AB98810021	AB.98810021.UC	Filler breather with telescopic strainer

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.



Filler Breathers

Option 3 Filler Breathers (3 Hole Installation)



New Options Fully Tested

As part of the design development programme for the new IP65 Filler Breathers, extensive performance and endurance testing was carried out to ensure durability and efficiency.

3-hole Filler Breathers (6-hole available)

Part number	Description 10µ nom
AB68110	Filler breather without strainer
AB68118	Filler breather with 95mm strainer

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.
Note 3: Not suitable for use with B.68206/207
Note 4: 6-hole AB.68910/AB.68918 option available.

Note: Form 3 off tank mounting holes between Ø4.0 and Ø4.4mm (dependent on the material and thickness – see chart for guide) equispaced on 41.3 P.C.D. to suit No. 10 thread forming screws supplied.

Dipstick Options

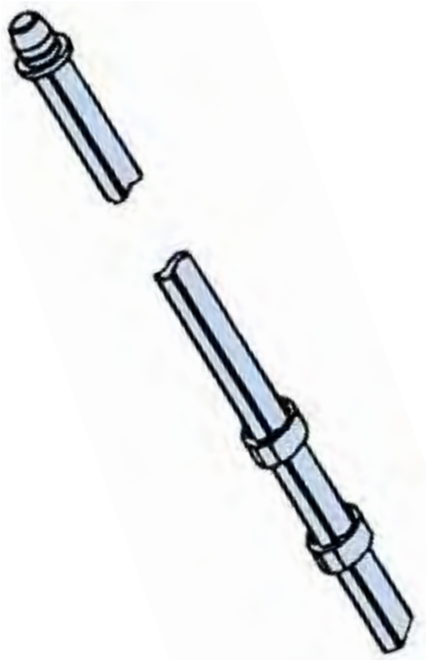
Dipstick Ordering

Part number	Supersedes	Description
B68206	DIP.206	10 x 200mm Dipsticks
B68207	DIP.207	10 x 400mm Dipsticks

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Dipsticks

The dipstick, available in 2 lengths – 200mm and 400mm, can be cut to the required length or left as it is and the Hi/Lo indicators moved and positioned on the dipstick itself by squeezing the sides of the indicator and repositioning along the dipstick.



Screw-On Type Air Breathers

Standard Screw-On Breathers - Specification

Option 1– G1/2 and G3/4 (Ø101)

Construction:
Moulded in non-corrodible glass-filled nylon combining strength with a lightweight design.

Option 1:
2 screw on type air breathers are available – G1/2 or G3/4 threaded base models.

Filtration element:
Expanded polyurethane foam, 10 micron nominal.

Seals:
Nitrile.

Working temperature:
-30°C to +90°C.

Pressurised air breathers:
Available in 3 pressure options to maintain a positive pressure in a reservoir.

Pressurisation options:
0.2, 0.35 and 0.7 bar crack pressure.

Pressurisation valve:
Nylon/Nitrile.

Dipstick:
Available for use with all options. Dipsticks are available in 2 lengths and in packs of 10.

Dipstick material:
ABS.

Hi/Lo indicators:
Acetal. Adjustable red/green level indicators.

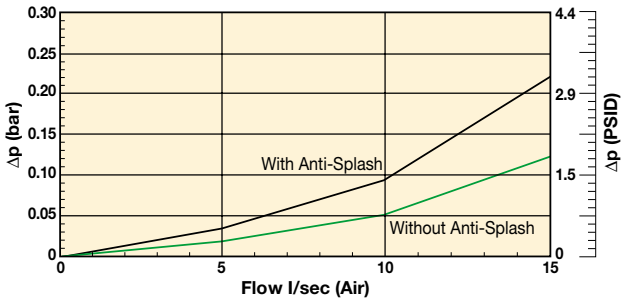
Dipstick lengths:
200mm and 400mm.

Breather weight:
0.2Kg.

Anti-splash feature:
The unique design anti-splash feature is standard on option 1 and allows for a dipstick to be fitted if required.

Pressure Drop Flow Curve

AB98XXX Screw-on Non-Pressurised Pressure Drop Curves

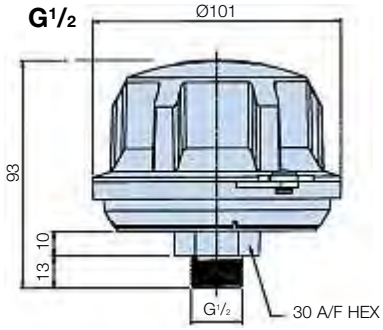


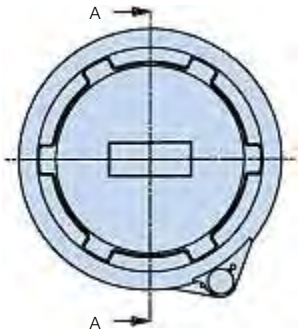
Note: For pressure drop information on the Option 1. Pressurised consult Parker Filtration.

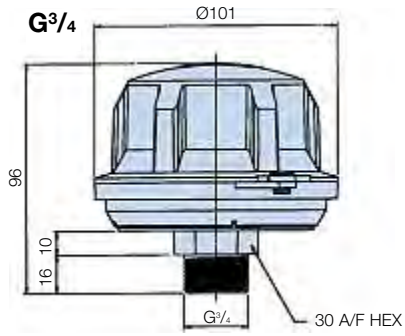
Option 1 – G1/2 or G3/4

Part number	Supersedes	Description 10µ nom
AB98610101	AB.98610101.UC	G1/2 Un-pressurised
AB98612101	AB.98612101.UC	G1/2 pressurised 0.2 bar
AB98613101	AB.98613101.UC	G1/2 pressurised 0.35 bar
AB98617101	AB.98617101.UC	G1/2 pressurised 0.7 bar
AB98410101	AB.98410101.UC	G3/4 Un-pressurised
AB98412101	AB.98412101.UC	G3/4 pressurised 0.2 bar
AB98413101	AB.98413101.UC	G3/4 pressurised 0.35 bar
AB98417101	AB.98417101.UC	G3/4 pressurised 0.7 bar

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.







Screw-On Type Air Breathers

Compact Screw-On Breathers - Specification

Option 2 – G1/4, G3/8, R1/2 and R3/4 (Ø40)

Construction:
G1/4, G3/8, R1/2 and R3/4 cap and base plate mouldings in nylon 66.

Element:
Expanded Polyurethane foam, 10 micron nominal.

Dipstick:
Available for use with R1/2 and R3/4.

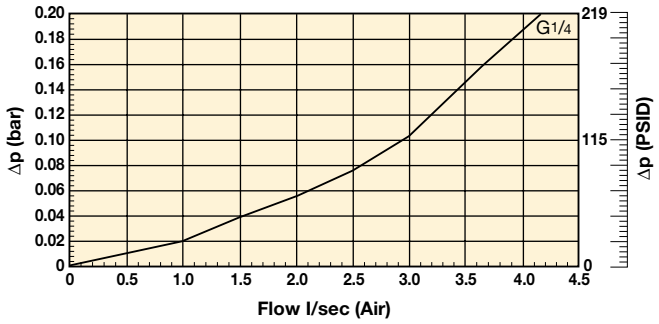
Dipstick material:
ABS.

Hi/Lo indicators:
Acetal adjustable red/green level indicators.

Dipstick lengths:
200mm and 400mm (packs of 10).

Breather weights:
0.028Kg

Pressure Drop Flow Curve



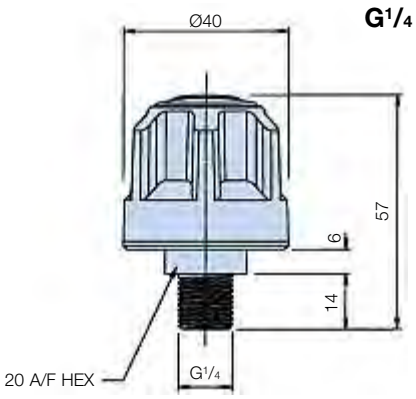
Note: For pressure drop information on G3/8, R1/2 and R3/4, consult Parker Filtration.

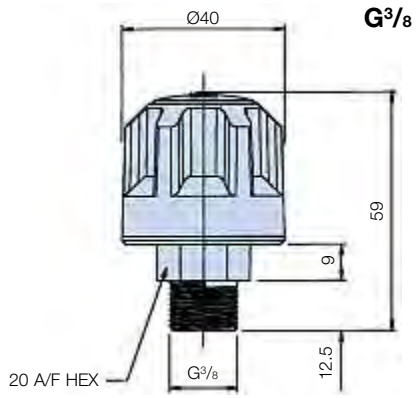
Ordering Information

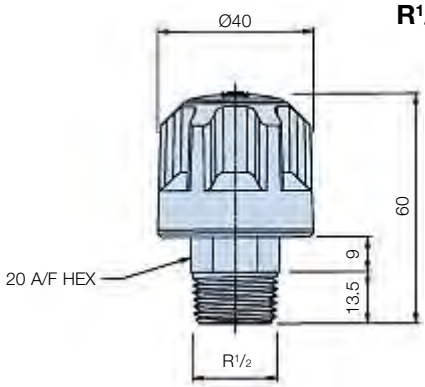
Option 2 – G1/4, G3/8, R1/2 and R3/4 (Packs of 10 only)

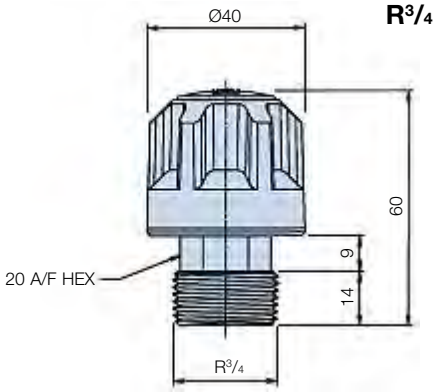
Part number	Supersedes	Description 10µ nom
AB683101	AB.683101.UC	G1/4 Un-pressurised
AB68X101	AB.68X101.UC	G3/8 Un-pressurised
AB68Y101	AB.68Y101.UC	R1/2 Un-pressurised
AB68Z101	AB.68Z101.UC	R3/4 Un-pressurised

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.









Screw-On Type Air Breathers - Specification

Option 3 – G3/8, G1/2 and G3/4 (Ø70)

Construction:
Mouldings in glass-filled nylon and glass coupled polypropylene.

Element:
Expanded Polyurethane foam, 10 micron nominal.

Seals:
Nitrile.

Pressurised air breathers:
Available G3/8, G1/2 and G3/4,
3 pressure options to maintain a positive pressure in a reservoir.

Pressurisation options:
0.2, 0.35 and 0.7 bar crack pressure.

Pressurisation valve:
Nylon.

Dipstick:
Available for use with G3/8, G1/2 and G3/4.

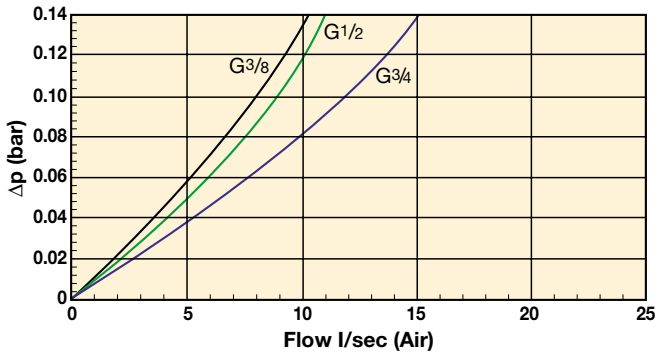
Dipstick material:
Mini-series in brass.

Hi/Lo indicators:
Acetal adjustable red/green level indicators.

Dipstick lengths:
200mm and 400mm (packs of 10).

Breather weights:
0.075Kg, Mini-series – 0.019Kg.

Pressure Drop Flow Curve



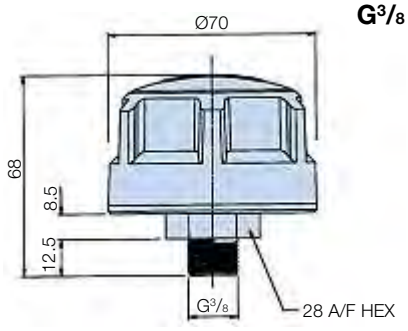
Ordering Information

Option 3 – G3/8, G1/2 and G3/4

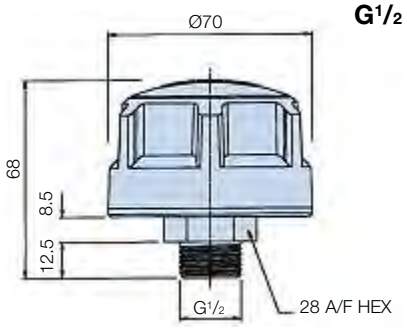
Part number	Supersedes	Description 10µ nom
AB685101	SAB.5101	G3/8 Un-pressurised
AB687101	SAB.7101	G3/4 Un-pressurised
AB686101	SAB.6101	G1/2 Un-pressurised

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

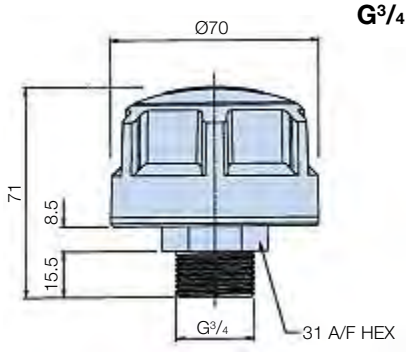
G3/8

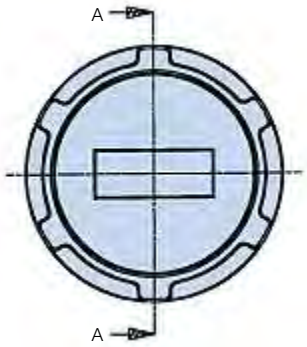


G1/2



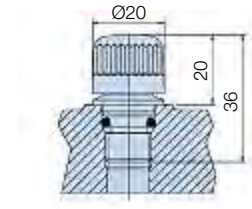
G3/4



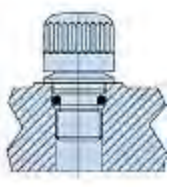


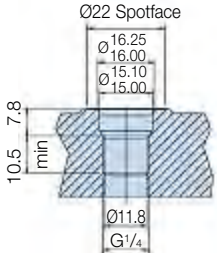
The mini-series breather

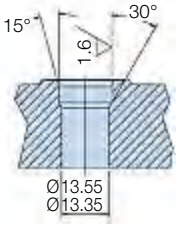
Screw-on option



Push-fit option



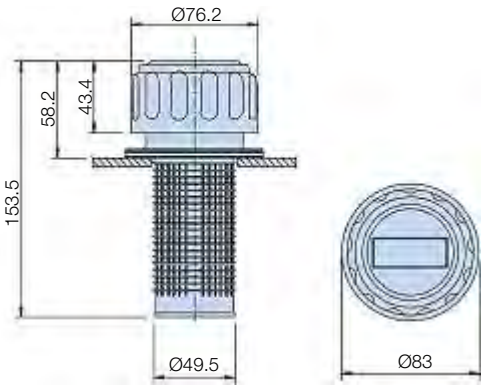




Part number	Description
S680003	Gearbox air breather

Filler Breathers (Metal)

Metal Airbreather/Filler breather Specification



Locking lug option (5561)

For added security, certain Parker Filtration Metal Filler Breather Filters can be specified with a locking lug option.

Ordering Information

Standard products table

Part number	Supersedes	Replacement cap	Supersedes	Displacement l/min	Crack pressure	Micron rating	Air flow m³/min	Thread	Weight
Threaded airbreather (unpressurised)									
SAB156210	SAB.1562.10	N/A	N/A	430	N/A	10µ nom	0.45	G¾	0.20kg
SAB156310	SAB.1563.10	N/A	N/A	135	N/A	10µ nom	0.15	G¼	0.06kg
Filler breather - filter flange type (unpressurised)									
AB116310	AB.1163.10	CAP.116310	CAP.1163.10	430	N/A	10µ nom	0.45	N/A	0.24kg
AB138010	AB.1380.10	CAP.138010	CAP.1380.10	135	N/A	10µ nom	0.15	N/A	0.08kg
5561	N/A	N/A	N/A	430	N/A	10µ nom	0.45	N/A	0.24kg
Filler breather - filter flange type (pressurised)									
PAB1730105	PAB.1730.10.5	CAP.1730105	CAP.1730.10.5	430	0.35 bar	10µ nom	0.45	N/A	0.27kg
PAB17301010	PAB.1730.10.10	CAP.17301010	CAP.1730.10.10	430	0.70 bar	10µ nom	0.45	N/A	0.27kg
Air breather - threaded type (pressurised)									
SPA1731105	SPA.1731.10.5	N/A	N/A	430	0.35 bar	10µ nom	0.45	G¾	0.20kg
SPA17311010	SPA.1731.10.10	N/A	N/A	430	0.70 bar	10µ nom	0.45	G¾	0.20kg

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

1731 - Threaded type (Pressurised)

Displacement:
430 l/min.

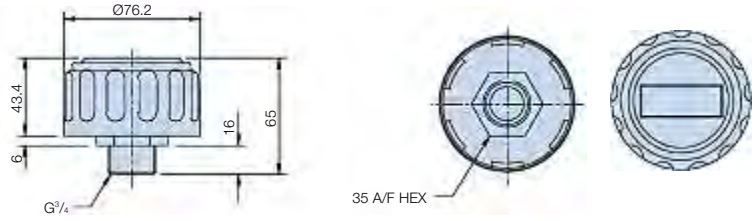
Micron rating:
10µ nominal

Air flow:
0.45m³/min.

Weight:
0.2 Kg.

Thread:
G3/4.

Valve crack-pressure:
0.35 and
0.7 bar.



1562-1563 - Threaded type (Un-pressurised

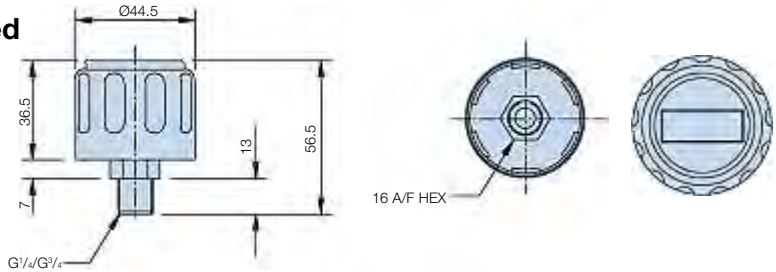
Displacement:
1562 = 430 l/min.
1563 = 135 l/min.

Micron rating:
10µ nominal

Air flow:
1562 = 0.45m³/min.
1563 = 0.15m³/min.

Weight:
1562 = 0.20 Kg.
1563 = 0.06 Kg.

Thread:
1562 = G3/4.
1563 = G1/4.



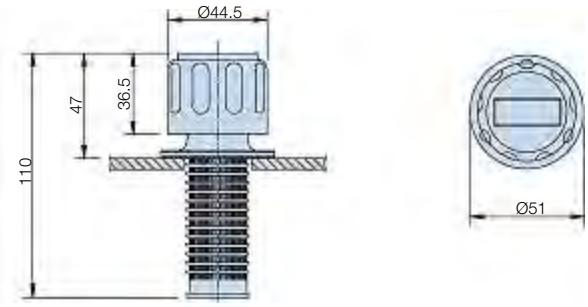
1380 - Filter flange type

Displacement:
135 l/min.

Micron rating:
10µ nominal

Air flow:
0.15m³/min.

Weight:
0.08 Kg.



Tank installation notes

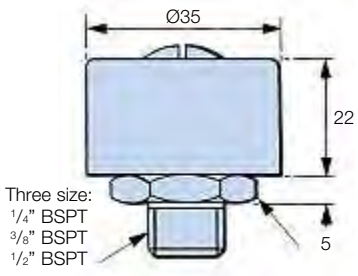
1. Un-pressurised 6 hole fixing
Form off tank mounting holes between Ø4.0 and Ø4.4 (dependant on the material and thickness, consult Parker Filtration) equispaced on 70.0-73.0 P.C.D. to suit
No. 10 thread forming screws supplied.

2. Pressurised 6 hole fixing
Form 6 off mounting holes between Ø4.0 and Ø4.4 equispaced on 73.0 P.C.D. to suit
No. 10 thread forming screws supplied.

3. Un-pressurised 3 hole fixing
Form 3 off tank mounting holes between Ø4.0 and Ø4.4 equispaced on 41.3 P.C.D. to suit
No. 10 thread forming screws supplied.

Breather Units

Small Breather Specification



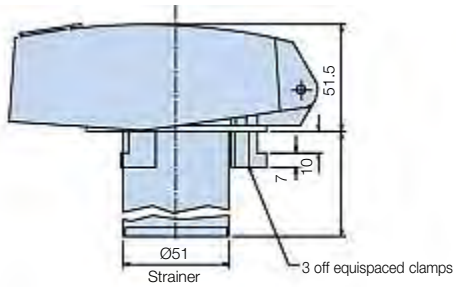
Ordering Information

Part number	Supersedes	Description
H00279001	H00279-001	Small breather 1/4 BSPT thread
H00279002	H00279-002	Small breather 3/8 BSPT thread
H00279003	H00279-003	Small breather 1/2 BSPT thread

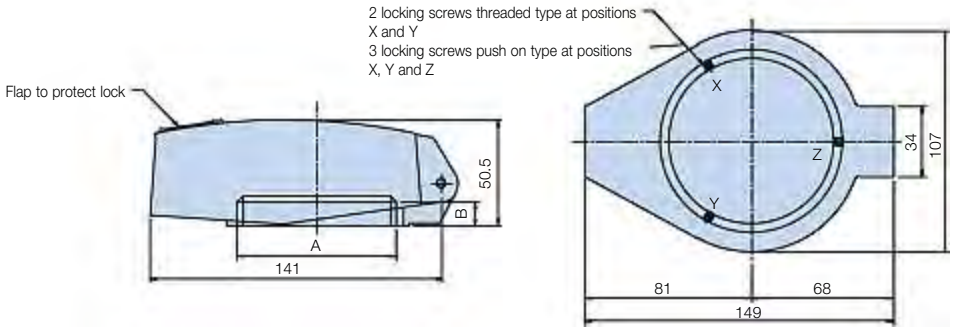
Lockable Filler Breather

Installation Details

Tank Mounting

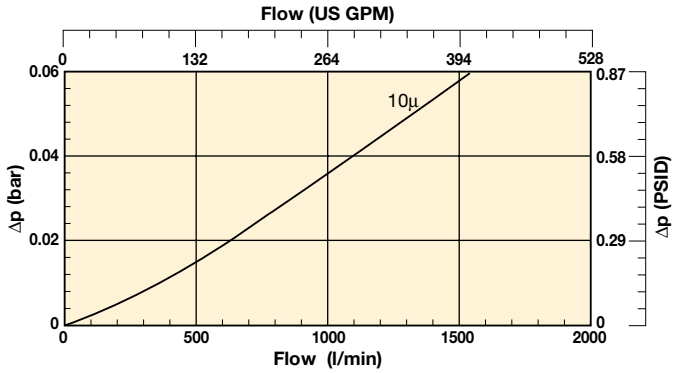


Stand Pipe Mounting



Lockable Filler Breather Selection

Total assembly pressure drop flow curve – 10µ elements



Ordering Information

Part number	Description
LFC622142	Non-breathing (No element) Clamp mounting with strainer
LFC622212	10µ nom element, G2 thread with strainer
LFC622242	10µ nom element, clamp mounting with strainer
LFC622432	10µ nom vented (air in) push on mounting with strainer
LFC622122	Non-breathing (No element) 2" BSP thread with strainer
LFC622222	10µ nom element, G2½ thread with strainer
LFC622411	10µ nom vented (air in) G2 thread without strainer

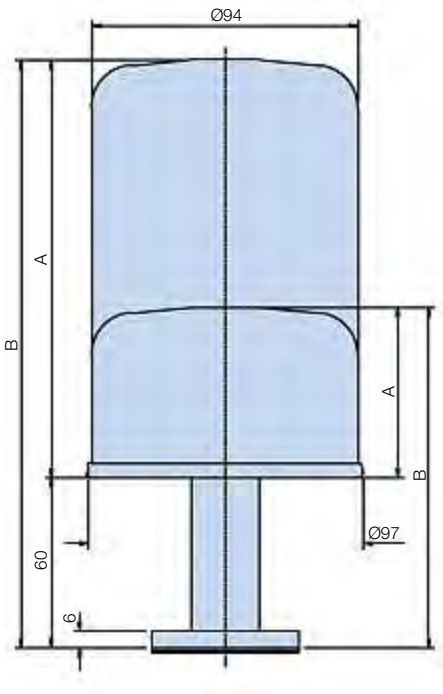
Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Spin-On Air Breathers

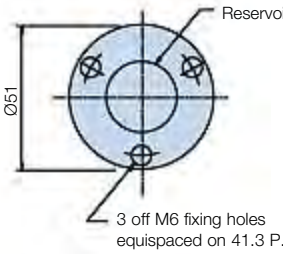
Spin-On Air Breathers

Specification

- High capacity air breathers designed for the removal of airborne contamination in hydraulic systems to support environmental maintenance.
- Ideal for high flow systems and heavily contaminated environments.
- Disposable spin-on elements quickly and easily replaced.
- 5 micron nominal quality filtration elements.
- 2 models available – 700 l/min and 1500 l/min.
- Available with a pressurised valve in the mounting adaptor.

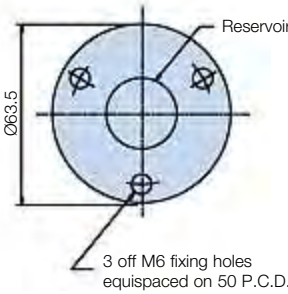


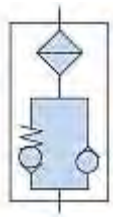
Standard spin-on air breather stem



Circuit symbol
(standard)

Pressurised spin-on air breather stem





Circuit symbol
(pressurised)

Note: Spin-on air breather elements can also be mounted directly on to any suitable length of 3/4" BSP threaded pipe.

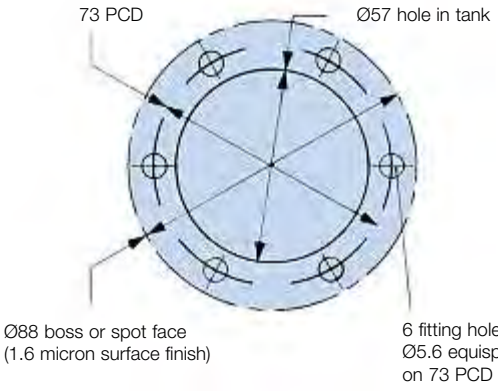
Ordering Information

5µ Spin-on air breathers

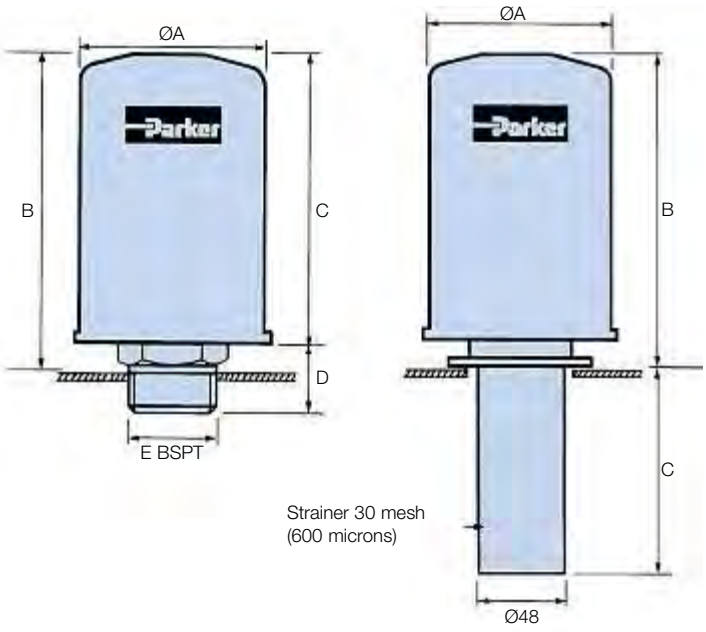
Part number	Supersedes	Air flow	Valve crack pressure	A mm	B mm	Weight	Replacement element
S340056	N/A	700 l/min	Unpressurised	60	120	0.6Kg	**4930**
S340052	N/A	1500 l/min	Unpressurised	148	208	0.75Kg	**588410**
S340058	*S.340058	700 l/min	0.35 Bar	60	120	0.69Kg	**4930**
S340059	**S.340059	700 l/min	0.70 Bar	60	120	0.69Kg	**4930**
S340054	*S.340054	1500 l/min	0.35 Bar	148	208	0.8Kg	**588410**
S340055	**S.340055	1500 l/min	0.70 Bar	148	208	0.8Kg	**588410**

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.
Note 3: Reservoir must be capable of withstanding pressurisation.

- High capacity air breathers and filler/breathers designed for the removal of airborne contamination in hydraulic systems to support environmental maintenance.
- Ideal for high flow systems and heavily contaminated environments.
- Disposable spin-on elements quickly and easily replaced.
- 3 micron absolute quality filtration elements.
- Models available – 1700 l/min and 3000 l/min.



Mounting face for standard and large breather



Large breather filter

Specification

Maximum operating temperature:
-20°C to +90°C.

Construction materials:
Epoxy coated steel components to resist corrosion. resistant paint finish on large breathers.

Fluid compatibility:
Suitable for use with mineral oils and water oil emulsions.

Weights:
Large: H00834001 1.0 Kg
H00834002 1.65 Kg
H00834003 1.90 Kg
Each breather filler is supplied with mounting gaskets and self-tapping screws.

Ordering Information

Large breather dimensions

Part number	Supersedes	Air flow l/min	Dimensions (mm)				Ports
			A	B	C	D	
H00834004	H00834-004	1700	97	147	135	30	¾
H00834005	H00834-005	3000	134	198	180	36	1¼

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Large breather filler dimensions

Part number	Supersedes	Air flow l/min	Dimensions (mm)			Replacement element complete with bayonet	Supersedes
			A	B	C		
H00834001	H00834-001	1700	97	165	114	H00834006	H00834-006
H00834002	H00834-002	3000	134	204	114	H00834007	H00834-007
H00834003	H00834-003	3000	134	204	203	H00834007	H00834-007

Notes

Fluid Level Measurement

Fluid Level Temperature Gauges

Fluid Level/Temperature Gauges

Specification

Construction:
Lens Transparent polyamide.
Lens base Nylon 66.
Shroud High impact polystyrene. No aluminium content.

Bolts:
Steel.

Seals:
Nitrile.

Maximum working pressure:
1 bar.

Working temperature:
-30°C to +90°C.

Fluid compatibility:
Mineral and petroleum based oils.

Note:
A 500mm model with metal shroud finished in black available.

Recommended bolt tightening torque:
10 Nm maximum.

Thermometer scale range:
+30°C to +90°C.

Temperature Indicator:
Blue alcohol.

Note:
1. Locate seals in mounting recess before fitting.
2. Select the size required by studying the installation details to determine a part number.

Size 1 Installation Details

For 'through hole' mounting:

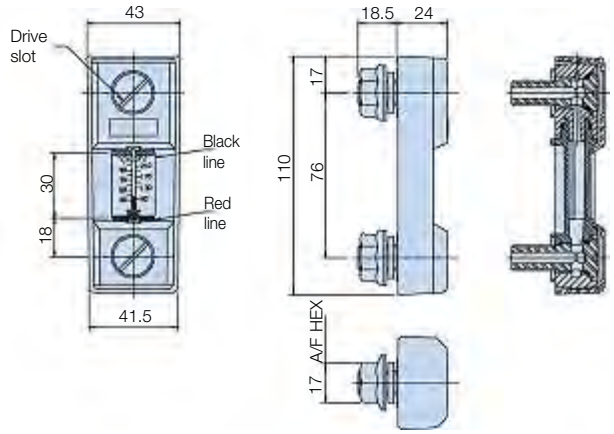
	–Thread–	
Hole size	M10	M12
Preferred	11.0	13.0
Maximum	13.0	14.0

For tapped holes:

Holes to be tapped square to mounting face.
Tolerance on hole centres: +0.5
-0.2

For welded back nuts:

The above details should be combined.



Installation and Application Information

Simple to Install

The universal fixing is designed for either front or rear fixing. Just two holes in the tank – threaded for front fixing – and the gauge is ready to install. After positioning the gauge the bolts are simply tightened to provide a secure seal. There is no fear of leakage with the square section seals and the two-point mounting system eliminates problems with tank distortion. M10 and M12 bolt thread options are available.

Easy to Read

The high-visibility lens is one-piece for added security and moulded in shatterproof, transparent polyamide for an accurate and clear oil level and temperature indication. Further gauge protection is provided by a specially designed shroud moulded in high-impact, black polystyrene.

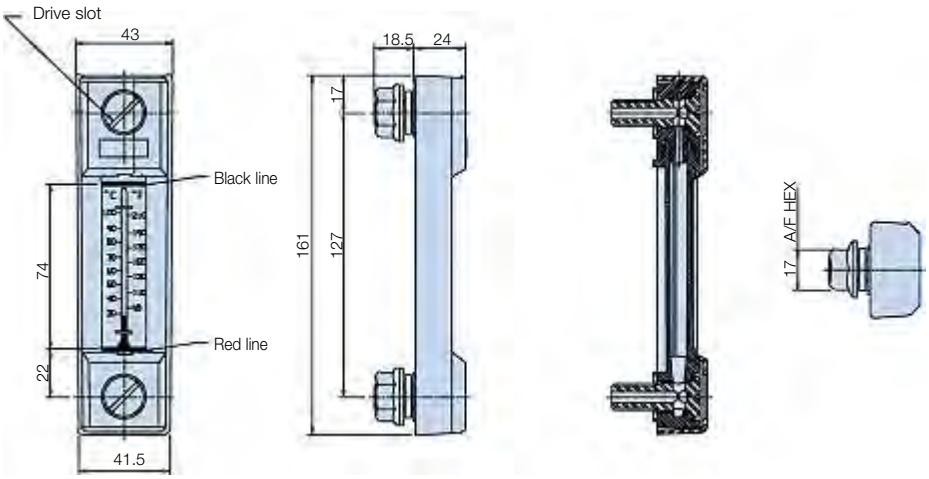
Size 1 Ordering Information

Standard products table

Part number	Supersedes	Desciption	Centres	Thread	Max temp	Weight
FL69121	FLT.121	Fluid level/temp	76mm	M10	90°C	0.13Kg
FL69123	FLT.123	Fluid level/temp	76mm	M12	90°C	0.13Kg
FL69111	FL.111	Fluid level	76mm	M10	90°C	0.13Kg
FL69113	FL.113	Fluid level	76mm	M12	90°C	0.13Kg

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Size 2 Installation Details



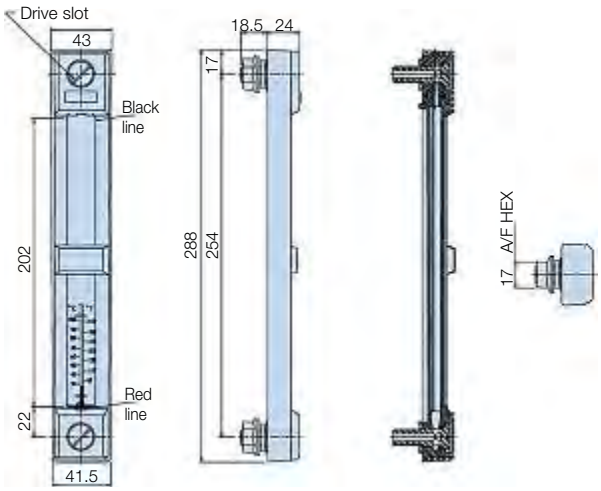
Size 2 Ordering Information

Standard products table

Part number	Supersedes	Desciption	Centres	Thread	Max temp	Weight
FL69221	FLT.221	Fluid level/temp	127mm	M10	90°C	0.15Kg
FL69223	FLT.223	Fluid level/temp	127mm	M12	90°C	0.15Kg
FL69211	FL.211	Fluid level	127mm	M10	90°C	0.15Kg
FL69213	FL.213	Fluid level	127mm	M12	90°C	0.15Kg

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Size 3 Installation Details



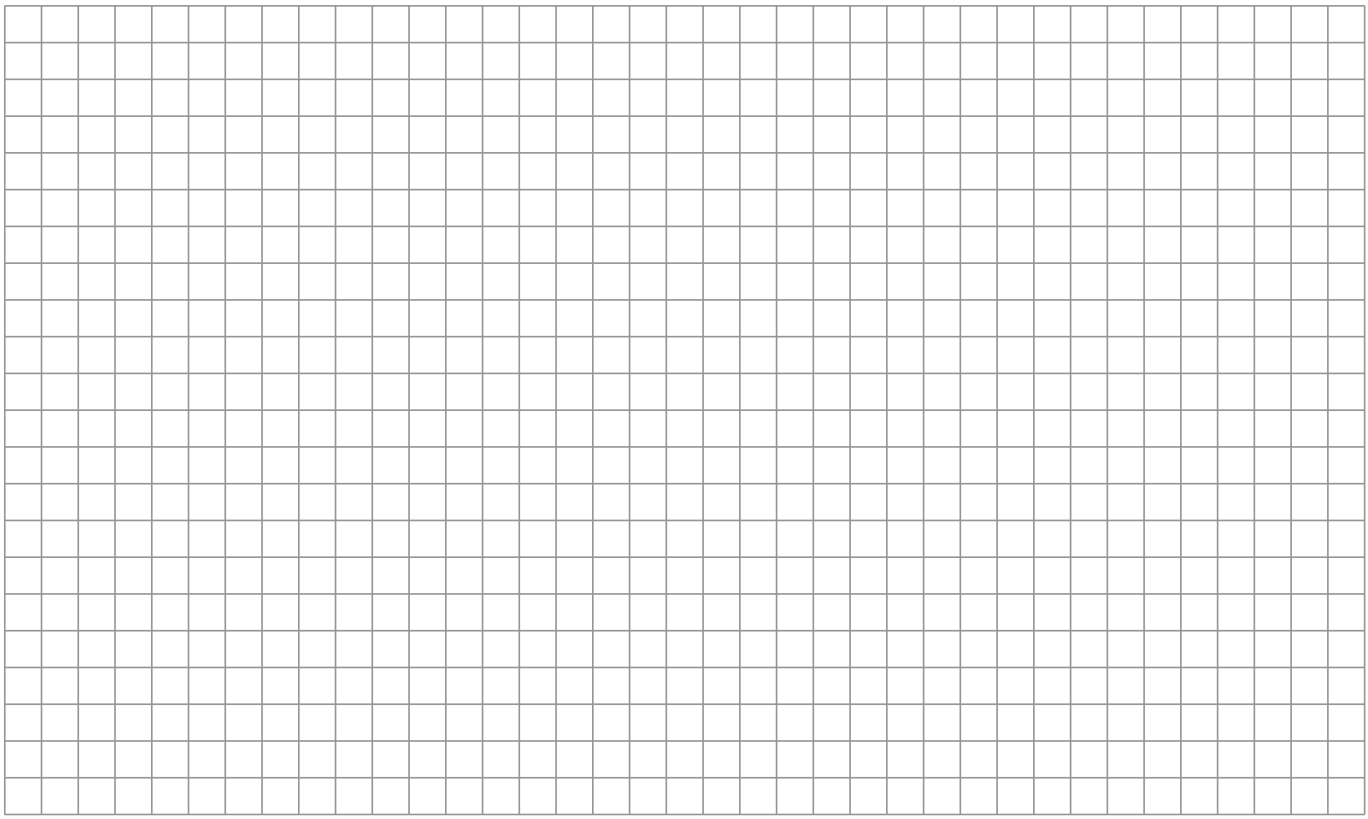
Size 3 Ordering Information

Standard products table

Part number	Supersedes	Desciption	Centres	Thread	Max temp	Weight
FL69321	FLT.321	Fluid level/temp	254mm	M10	90°C	0.23Kg
FL69323	FLT.323	Fluid level/temp	254mm	M12	90°C	0.23Kg
FL69311	FL.311	Fluid level	254mm	M10	90°C	0.23Kg
FL69313	FL.313	Fluid level	254mm	M12	90°C	0.23Kg

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Notes



Reservoir Float & Level Switches

FL Series

Adjustable Float Switch

Features & Benefits

Float Switch Features Include:

- Float switches can be adjusted on site
- Reliable design using reed switches
- 3 lengths available, 500mm, 1000mm and 1500mm

The **FL Series** is a range of vertically mounted, single float level switches operating on the proven reed switch and magnet principle.

The **FL Series** float switch can be tailored by the user for a particular application, by adjusting the length of the float switch tube. It is also possible for the user to select the switching configuration by inverting the float, giving either open on rise or close on rise operation.

The unit is supplied part assembled, with detailed instructions for the user to complete assembly to the specifications of the application and to install the unit.

The **FL Series** is designed to be adjusted by the user to fit their tank. The unit consists of a stem with the reed switch, thermal switch (if fitted) and float already set in position. The customer can cut the stem to fit their tank, and assemble it to the header. The unit is then ready to be fitted to the tank.

The unit has a factory set “Open On Rise” switching configuration, but this can be changed by reversing the float. The common temperature switches used are 60°C “Open On Rise” or 60°C “Close On Rise”. However, other temperature specifications may be obtained on request. A standard DIN 43650 connector is supplied with the unit.

Typical Specification

Installation

Mounting:	1” BSP threaded header
Gasket:	2.0mm thick sealing washer
Length:	Adjustable up to 1500mm

Electrical specification

Supply voltage:	240 Vac maximum 300 Vdc maximum
Switching current:	0.5A

Thermostat ratings

Normal voltage:	250V
Current rating:	4A (10A max)

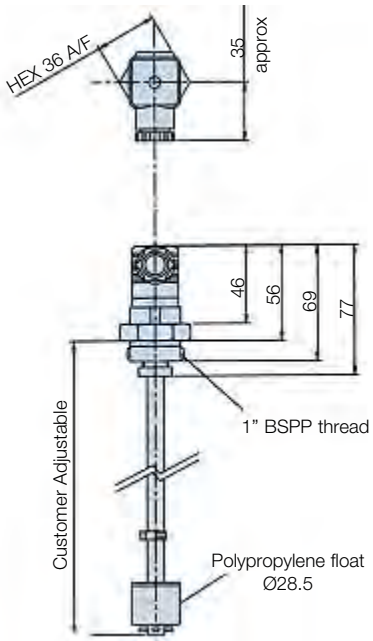
Material specification

Header:	Brass	Stem:	Brass
Float:	Polypropylene	Gasket:	Klingersil grade C4324 to BS7531 grade Y

Other parameters

Fluid types:	Any liquids compatible with brass and polypropylene

Installation Drawing



Ordering Information

Standard products table

Part number	Supersedes	Desciption
FL050010R	FL-0500-1-0R	500mm long float level switch
FL100010R	FL-1000-1-0R	1000mm long float level switch
FL150010R	FL-1500-1-0R	1500mm long float level switch

Note 1: Part numbers featured with bold highlighted codes will ensure a ‘standard’ product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

CLS46

Capacitive Level Switch

Features & Benefits

Features Include:

- Rugged construction
- Simple to install
- Delay circuitry prevents false alarms
- Purely electronic, no moving components
- Integrated test feature

The **CLS46 Liquid Level Switch** is an active device which is designed to give an alarm signal if fluid falls below a preset level. It will only give an output signal after a few seconds of low level to eliminate false alarms due to turbulence. The fact that the **CLS46 Series** has no moving parts and incorporates a built in delay means that it is ideal in applications where mechanically operated switches mis-trigger due to vibration and fluid turbulence.

The **CLS46 Capacitive Level Switch** is designed to detect the loss of fluid below its position in the tank.

The **CLS46 Series** has no moving parts and it is therefore suitable for all applications, particularly where space and access inside a vessel is at a minimum.

The **CLS46 Series** compliments the existing range of level measurement instrumentation supplied by Parker Hannifin.

Technical Specification

Dimensions: See drawing

Electrical rating:

Supply voltage:	7-40 Vdc	Supply current:	3.0mA
Max. load current:	1.0A	Alarm delay time:	10.0 seconds

Connections:

V+:	Positive power supply
GND:	Negative power supply or GND
Output:	Transistor switched to GND on alarm
Test:	Ground to operate
Body:	Connected to ground

Fluid types:
Water based fluids compatible with brass, PTFE and flurosilicone

Construction:

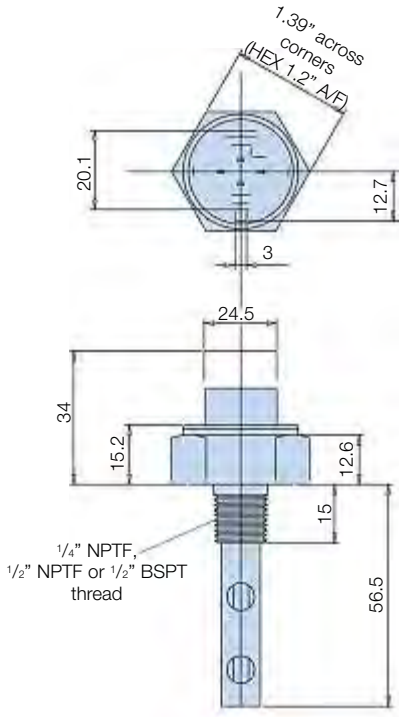
Body:	Brass	Probe:	PTFE
Terminals:	SAE CA210 brass, tin plated		
Seals:	Flurosilicone		
Connector:	30% glass filled nylon 6		

Environmental ratings

Max. pressure:	5.0 bar (72 PSI)	
Temp. ranges:	Fluid:	-40°C to +130°C
	Ambient:	-40°C to +100°C
	Storage:	-50°C to +140°C

Sealing: IP67
Vibration: 6g 10-50Hz (600-3000rpm)
Shock: 50g, 6.3mS
Weight: 53g

Installation Details



Ordering Information

Standard products table

Part number	Desciption
CLS46	Capacitive fluid level sensor
CLS46Connector	Capacitive fluid level sensor connector

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Fluid Power Products

Hydraulic system protection from Parker is further confirmed with a quality range of fluid power products that include suction strainers, check valves pressure gauges and a pipe clamping system that will ensure secure pipe installations.

For information on Parker Filtration products and technology:
Tel: +44(0)1924 487000 Fax: +44(0)1924 487001 Email: filtrationinfo@parker.com

Suction Elements

Suction Elements

Specification

Construction:
Stainless steel media 30% glass filled nylon head. Zintec centre tube.
Epoxy adhesives.

Maximum working temperature:
90ºC.

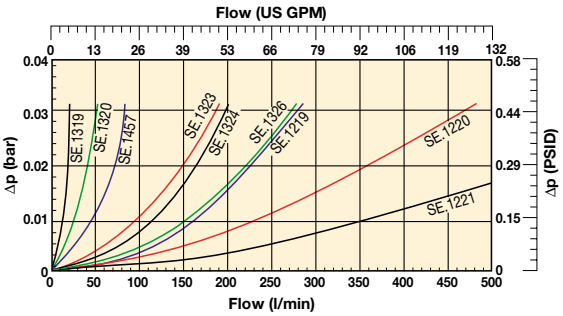
Filtration media:
125 micron*.

Flow range:
15-500 l/min.

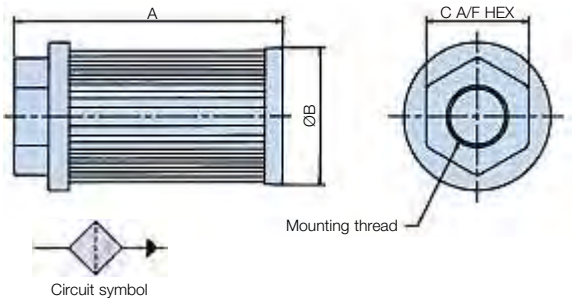
Bypass rating:
0.17 bar.

Mounting threads:
G1/2 up to G3.

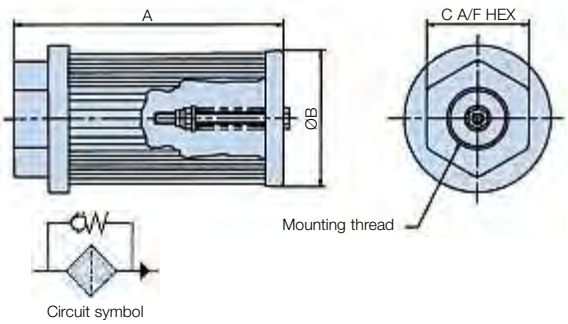
* Non-standard elements are available to order. Consult Parker Filtration.



Installation - Suction Elements Without Bypass



Installation - Suction Elements with Bypass



Ordering Information - Without Bypass

Standard products table

Part number	Supersedes	Air flow l/min	Ports BSP	Micron rating	Dimensions (mm)			Weight kg	Bypass rating
					A	B	C		
SE75111110	SE.1319	15	1/2	125	105.5	46	36	0.08	N/A
SE75221110	SE.1320	25	3/4	125	109.5	64	46	0.15	N/A
SE75231210	SE.1457	50	1	125	139.5	64	55	0.17	N/A
SE75351210	SE.1323	95	1 1/2	125	140	86	65	0.28	N/A
SE75351310	SE.1324	130	1 1/2	125	200	86	65	0.33	N/A
SE75361410	SE.1326	180	2	125	260	86	75	0.40	N/A
SE75461210	SE.1219	225	2	125	150	150	70	0.64	N/A
SE75471310	SE.1220	350	2 1/2	125	212	150	90	0.72	N/A
SE75481410	SE.1221	500	3	125	272	150	100	0.92	N/A

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Ordering Information - With Bypass

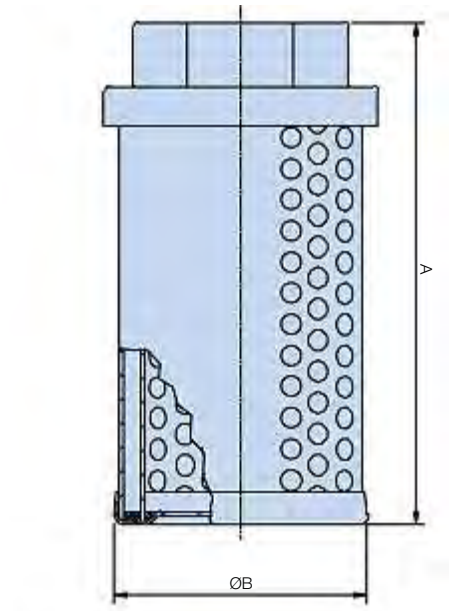
Standard products table

Part number	Supersedes	Air flow l/min	Ports BSP	Micron rating	Dimensions (mm)			Weight kg	Bypass rating
					A	B	C		
SE75111111	SE.5100	15	1/2	125	105.5	46	36	0.11	0.17 bar
SE75221111	SE.5101	25	3/4	125	109.5	64	46	0.18	0.17 bar
SE75231211	SE.5102	50	1	125	139.5	64	55	0.21	0.17 bar
SE75351211	SE.5103	95	1 1/2	125	140	86	65	0.31	0.17 bar
SE75351311	SE.5104	130	1 1/2	125	200	86	65	0.36	0.17 bar
SE75361411	SE.5105	180	2	125	260	86	75	0.43	0.17 bar
SE75461211	SE.5106	225	2	125	150	150	70	0.67	0.17 bar
SE75471311	SE.5107	350	2 1/2	125	212	150	90	0.75	0.17 bar
SE75481411	SE.5108	500	3	125	272	150	100	0.95	0.17 bar

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Diffusers

Installation Details

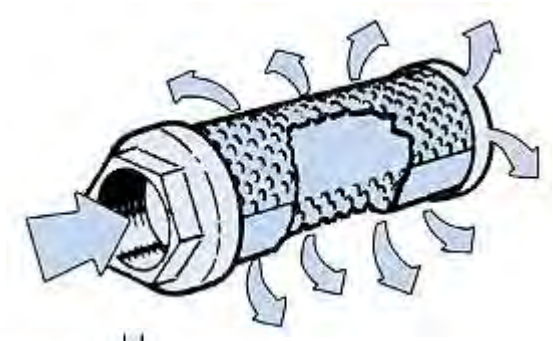


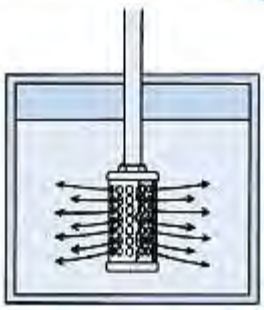
Specification

Construction:
Zintec body.
30% glass-filled nylon head.
Zintec end cap.
Epoxy adhesives.

Flow range:
50 l/min up to 454 l/min.

Mounting threads:
G3/4 up to G2.





The effect of fitting a diffuser

Note: When installing a diffuser the plain area on the outside must be facing the pump inlet.

The benefits of specifying a Parker Filtration Diffuser

Installing a Parker Filtration Diffuser in a hydraulic reservoir is a simple operation that can make a big difference to system efficiency.

With its special concentric tubes designed with discharge holes 180° opposed fluid aeration, foaming and reservoir noise are reduced and pump life extended by reducing cavitation to the pump inlet.

Diffusers manufactured to customer specifications and other sizes of diffusers are available.

Ordering Information

Standard products table

Part number	Flow l/min	Ports BSP	Dimensions (mm)			Weight kg
			A	B	C	
2201	114	1	127	86	55	0.42
2202	227	1 1/2	178	86	65	0.56
2210	50	3/4	120	62	46	0.27
2203	454	2	242	86	75	0.69

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Inline Filters

Metal Inline Filter - Specification

Construction:
Head – zinc.
Bowl – Aluminium
BS1470/1050A. 1987.

Element:
Zintec/Stainless steel.
125 micron*.

Max. flow:
90 l/min.

Max working pressure:
7 bar.

Thread:
G1.

Working temperature:
-30°C to +80°C.

Seal:
Nitrile.

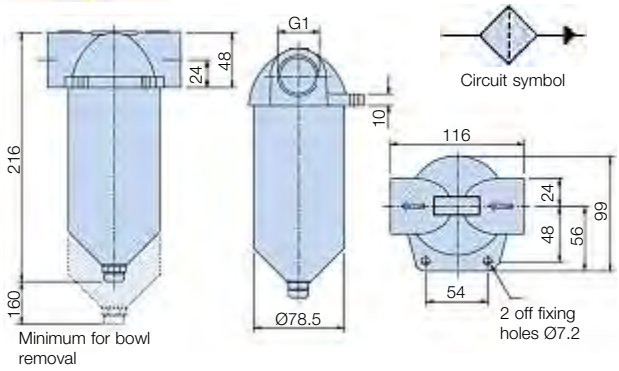
Bowl tightening torque:
12 Nm.

Flow direction:
From outside to inside.

Weight:
1.5 Kg.

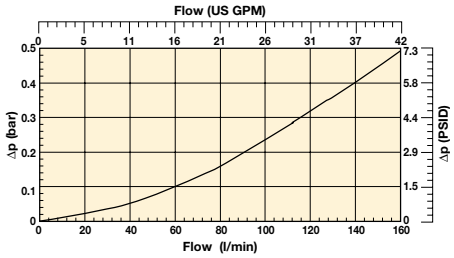
*Alternative media can be specified.

Installation Details



Filter Selection

Total assembly pressure drop flow curve
Oil Viscosity 30 cSt Relative density 0.856



Ordering Information

Standard products table

Part number	Flow l/min	Thread BSP	Micron rating	Replacement element	Supersedes
IL1115	90	G1	125	**EIL1115**	E.IL.1115

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Non-Corrodible Inline Filter - Specification

Construction:
Housing and bowl moulded in polyester.

Element:
Stainless steel mesh.
125 micron*.

Max. flow:
120 l/min.

Max working pressure:
7 bar.

Thread:
G1.

*For alternative media consult Parker Filtration
Note: When using with water, protect from freezing.

Working temperature:
-30°C to +80°C.
(+60°C water).

Seal:
Nitrile.

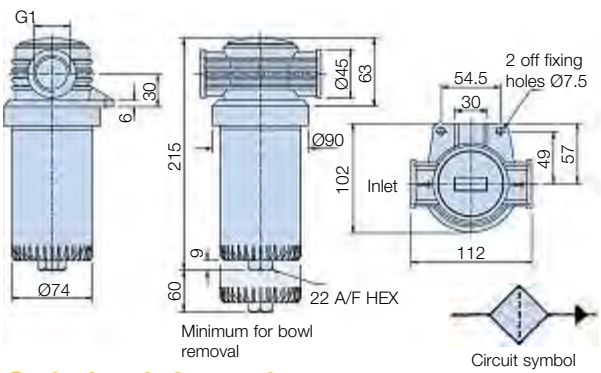
Bowl tightening torque:
12 Nm.

Bowl tightening note:
A box or ring spanner is recommended.

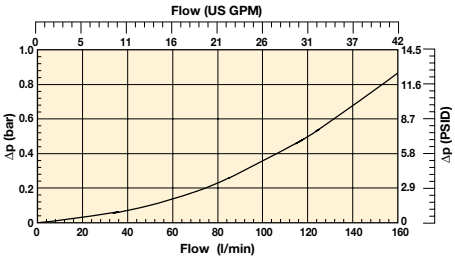
Flow direction:
From outside to inside.

Weight:
0.5 Kg.

Installation Details



Total assembly pressure drop flow curve
Oil Viscosity 30 cSt Relative density 0.856



Ordering Information

Standard products table

Part number	Supersedes	Thread BSP	Appliance	Micron rating	Weight	Replacement element
IL761151	IL.1151	1	Oil	125	0.5	**R.76115**
IL761251	IL.1251	1	Water	125	0.5	**R.76125**

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Drive Couplings

Technical Data

Materials

Coupling halves
Sintered Steel

Sleeve
Nylon 66

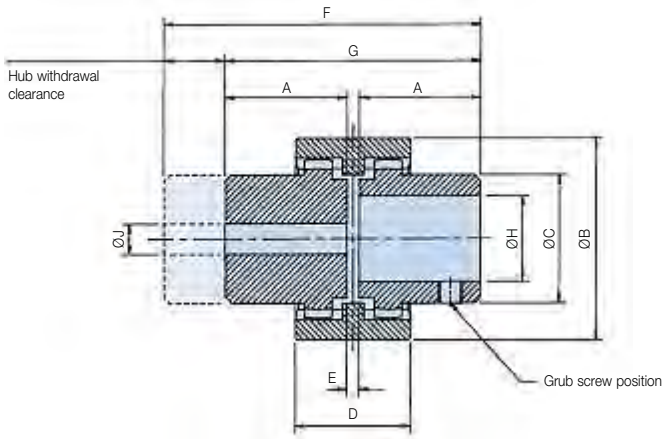
Max temp sleeve
83°C

To select coupling model check application to establish running load condition.
Check chart for factor (F) and apply factor (F) to *Rating of coupling formulae. This answer you now apply to *Rating/100 rev/min below.
It is advisable always to check shaft sizes being used on application and check with dimension 'H'.

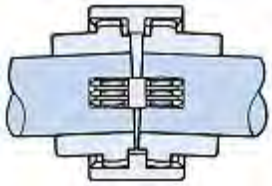
	Factor (F)	
Application	Electric motor	Petrol/diesel engine
Uniform load	1.00	1.20
Medium shock	1.25	1.50
Heavy shock	1.75	2.00

$$\text{*Rating of coupling} = \frac{\text{HP of application x 100 x F}}{\text{rev/min of application}}$$

Installation Details



Sectioned detail



Part number prefix	Max speed rev/min	*Rating/ 100 rev/min kW	hp	Weight	A mm	B mm	C mm	D mm	E mm	F mm	G mm	max bore	–H– min bore	J pilot bore
DC28*	5000	0.75	1.00	0.4	40.0	66.0	44.5	38.0	4.0	104.0	84.0	28.0	10.0	7.0
DC42*	5000	1.32	1.75	0.75	42.0	90.0	60.0	42.0	4.0	115.0	88.0	42.0	14.0	10.5
DC55*	4000	6.00	8.00	2.05	59.0	125.0	83.0	65.0	4.0	158.0	122.0	55.0	19.0	16.0 min 38.1 max

Height of keyway from base of bore

	Metric	Imperial
Standard bore	BS 4500, (1985)	BS 1916, Part 1, (1985)
Standard keyway	BS 4325, Part 1 (1980)	BS 46, Part 1, (1985)

Assembly data

1. Maximum angular misalignment is ±2°. Maximum radial misalignment is ±0.4mm.
2. Ensure that the Parker Filtration drive coupling gear hubs are an easy fit to their respective shafts. Do not use heavy blows to force the hubs on.
3. When in position, the hubs should have a gap of 4mm as denoted by 'E' dimension.
4. Tighten grub screws to locate both gear hubs on to their respective shafts.

Ordering Examples

Parker Filtration drive coupling components are ordered separately. Here are three examples of complete assemblies ordered this way.

1. Complete assembly – **DC28M14B04K**
   Made up of a **DC28M14**
   DC28B04K
   DC28.S (Sleeve)

Complete model **DC28** drive coupling: One gear hub has 14mm bore with 5mm wide keyway and other hub has a 1/2" bore with 0.125" wide keyway.
Both hubs supplied with locating grub screw.

2. Complete assembly – **DCR42PBPB**
   Made up of 2x **DCR42PB's**
   DC42S (Sleeve)

Complete model DC42 drive coupling: Both gear hubs have pilot bore of 10.5mm. Not supplied with grub screws.

3. Complete assembly – **DCR55PBB12K**
   Made up of a **DCR55PB**
   DC55B12K
   DC55S (Sleeve)

Complete model **DC55** drive coupling: One gear hub pilot bored 5/8", the other hub pilot bored 1 1/2". Latter only supplied with grub screw.

Drive Couplings

Ordering Information

Model DC.28

Part number	Supersedes	Dimensions (mm)			Weight
		Ø Bore	Width	Height	
DC28M16	DC.28.M16	16.0mm	5.0mm	18.4mm	Range from 0.259Kg to 0.411Kg
DC28M19	DC.28.M19	19.0mm	6.0mm	21.9mm	
DC28M20	DC.28.M20	20.0mm	6.0mm	22.9mm	
DC28M22	DC.28.M22	22.0mm	6.0mm	24.9mm	
DC28M24	DC.28.M24	24.0mm	8.0mm	27.5mm	
DC28M25	DC.28.M25	25.0mm	8.0mm	28.5mm	
DC28M28	DC.28.M28	28.0mm	8.0mm	31.5mm	
DCR28PB	DCR.28.PB	N/A	8.0mm	N/A	
DC28S	DC.28.S	N/A	N/A	N/A	
DC28M10	DC.28.M10	10.0mm	3.0mm	11.5mm	
DC28M11	DC.28.M11	11.0mm	4.0mm	12.9mm	
DC28M14	DC.28.M14	14.0mm	5.0mm	16.4mm	
DC28M18	DC.28.M18	18.0mm	6.0mm	20.9mm	
DC28B03K	DC.28.B03K	7/16	0.125 ins	0.50 ins	
DC28B04K	DC.28.B04K	1/2	0.125 ins	0.57 ins	
DC28B05K	DC.28.B05K	5/8	0.188 ins	0.72 ins	
DC28B06K	DC.28.B06K	3/4	0.188 ins	0.84 ins	
DC28B07K	DC.28.B07K	7/8	0.250 ins	0.99 ins	
DC28B08K	DC.28.B08K	1	0.250 ins	1.12 ins	
DC28B09K	DC.28.B09K	1 1/8	0.313 ins	1.24 ins	

Model DC.42

Part number	Supersedes	Dimensions (mm)			Weight
		Ø Bore	Width	Height	
DC42M25	DC.42.M25	25.0mm	8.0mm	28.5mm	Range from 0.436Kg to 0.753Kg
DC42M28	DC.42.M28	28.0mm	8.0mm	31.5mm	
DC42M30	DC.42.M30	30.0mm	8.0mm	33.5mm	
DC42M35	DC.42.M35	35.0mm	10.0mm	38.5mm	
DC42M38	DC.42.M38	38.0mm	10.0mm	41.5mm	
DC42M42	DC.42.M42	42.0mm	12.0mm	45.5mm	
DCR42PB	DCR.42.PB	N/A	12.0mm	N/A	
DC42S	DC.42.S	N/A	N/A	N/A	
DC42M18	DC.42.M18	18.0mm	6.0mm	20.9mm	
DC42M19	DC.42.M19	19.0mm	6.0mm	21.9mm	
DC42M20	DC.42.M20	20.0mm	6.0mm	22.9mm	
DC42M22	DC.42.M22	22.0mm	6.0mm	24.9mm	
DC42M24	DC.42.M24	24.0mm	8.0mm	27.5mm	
DC42M32	DC.42.M32	32.0mm	10.0mm	35.5mm	
DC42B05K	DC.42.B05K	5/8	0.188 ins	0.72 ins	
DC42B06K	DC.42.B06K	3/4	0.188 ins	0.84 ins	
DC42B07K	DC.42.B07K	7/8	0.250 ins	0.99 ins	
DC42B08K	DC.42.B08K	1	0.250 ins	1.12 ins	
DC42B09K	DC.42.B09K	1 1/8	0.313 ins	1.24 ins	
DC42B10K	DC.42.B10K	1 1/4	0.313 ins	1.37 ins	
DC42B11K	DC.42.B11K	1 3/8	0.375 ins	1.49 ins	
DC42B12K	DC.42.B12K	1 1/2	0.375 ins	1.61 ins	
DC42B13K	DC.42.B13K	1 5/8	0.439 ins	1.76 ins	

Model DC.55

Part number	Supersedes	Dimensions (mm)			Weight
		Ø Bore	Width	Height	
DCR55PB	DCR.55.PB	N/A	16.0mm	N/A	Range from 1.248 Kg – 2.046 Kg
DC55S	DC.55.S	N/A	N/A	N/A	
DC55M25	DC.55.M25	25.0mm	8.0mm	28.5mm	
DC55M28	DC.55.M28	28.0mm	8.0mm	33.5mm	
DC55M30	DC.55.M30	30.0mm	8.0mm	33.5mm	
DC55M32	DC.55.M32	32.0mm	10.0mm	35.5mm	
DC55M35	DC.55.M35	35.0mm	10.0mm	38.5mm	
DC55M38	DC.55.M38	38.0mm	10.0mm	41.5mm	
DC55M42	DC.55.M42	42.0mm	12.0mm	45.5mm	
DC55M55	DC.55.M55	55.0mm	16.0mm	59.5mm	
DC55B09K	DC.55.B09K	1 1/8	0.313 ins	1.24 ins	
DC55B10K	DC.55.B10K	1 1/4	0.313 ins	1.37 ins	
DC55B11K	DC.55.B11K	1 3/8	0.375 ins	1.49 ins	
DC55B12K	DC.55.B12K	1 1/2	0.375 ins	1.61 ins	
DC55B13K	DC.55.B13K	1 5/8	0.439 ins	1.76 ins	
DC55B14K	DC.55.B14K	1 3/4	0.439 ins	1.89 ins	
DC55B15K	DC.55.B15K	1 7/8	0.501 ins	2.01 ins	
DC55B16K	DC.55.B16K	2	0.501 ins	2.13 ins	
DC55B17K	DC.55.B17K	2 1/8	0.626 ins	2.31 ins	

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Pipe Clamp System

Multiclamp

Multiclamp

When only the best Clamping System will do ....specify Multiclamp

Multiclamp is a system. A system of components, each one engineered to a high standard – that together build to provide effective, all-purpose pipework clamping. Multiclamp offers creative and cost-effective environmental benefits to the system designer and installer. Creating accurate runs of varying diameter tubes, pipes, hoses and cables in all industries.

Secure Multiclamp installations ensure a leak free, noise free and vibration free system.

The neat design of pipe line runs offers easy maintenance of machinery and plant equipment. Visual planning of line runs is straightforward with Multiclamp – accurate installations can be achieved without skilled labour – keeping costs down and quality up.

Planning with Multiclamp

These notes have been compiled to assist in planning your Multiclamp system.

Multiclamp offers considerable flexibility. For example, it can fit in with a factory installation that is being built in phases.

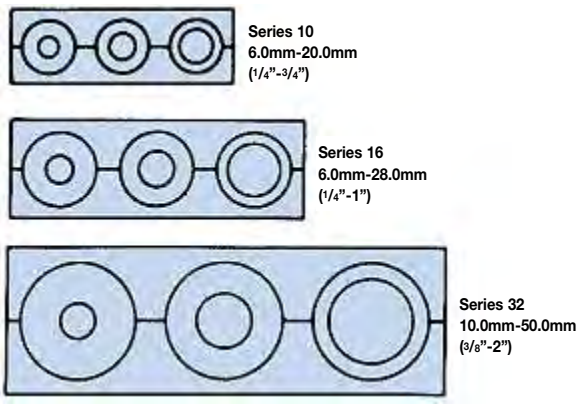
Should a last minute change in pipe diameter occur during installation, an alternative rubber bush is likely to be all that is required. Not a complete and expensive re-think of the installation.

Multiclamp metal components can be sprayed to match a vehicle livery or plant installation and, if installed properly, should require no maintenance.

Installation is simple and requires no experience

Anyone can use Multiclamp and only the basic, everyday tools are required.

From one pipe to almost any number – because each Multiclamp 'position' can be visually sighted and its position adjusted – an almost guaranteed straight run can be obtained. Equally, changes of plane or direction can be achieved simply and securely.



Your maximum pipe size will determine the series to use. There is a degree of versatility provided by the rubber bushes. You choose from single or multistacked Multiclamp, whichever suits your particular installation requirements.

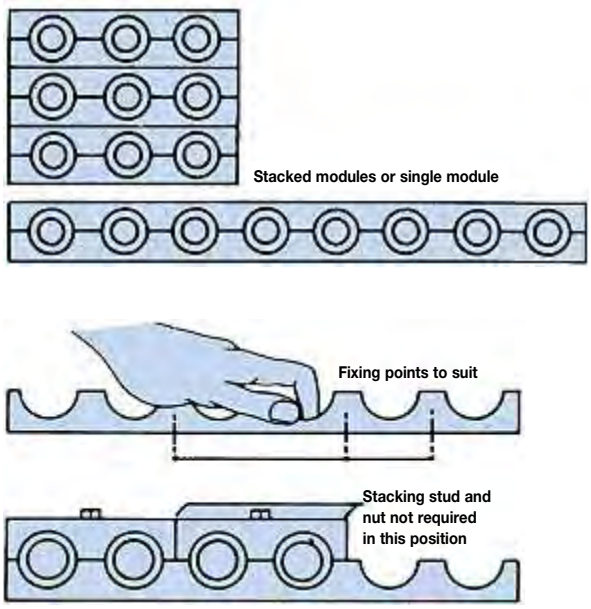
Group pipe sizes together to obtain the most economical use of three basic Multiclamp Series.

Some sites will require all pipes mounted in one single plane – either vertical or horizontal.

When stacked modules are preferred, the only work to be done on the Multiclamp is to saw off the desired length.

If a large number of pipe lines are to be run, it is recommended that the upper clamping unit is simply cut into two lines only, and progressively assembled by securing two pipes at a time. It will be recognised that most odd lengths on site will be used, and one man can easily cope with a large number of pipe lines by this simple progressive build up. This assembly will provide easy access for servicing and replacing pipes. This method also reduces the quantity of Stacking Nuts and Studs by 50%.

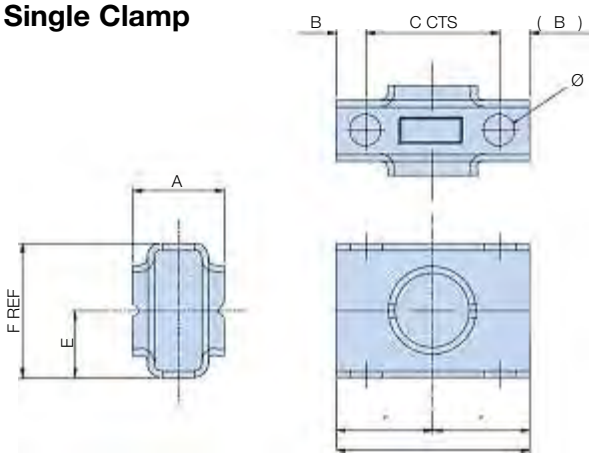
If a factory installation is being built in phases, it would be wise to leave the first phase with a lower clamping unit and Stacking Nuts in position ready to receive pipe runs for the next building phase.



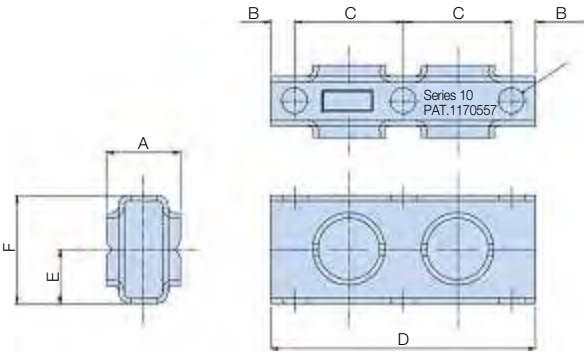
Specification

Dimension details supplied in product configurator

Single Clamp

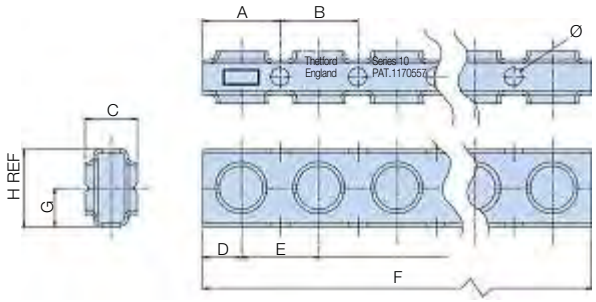


Double Clamp



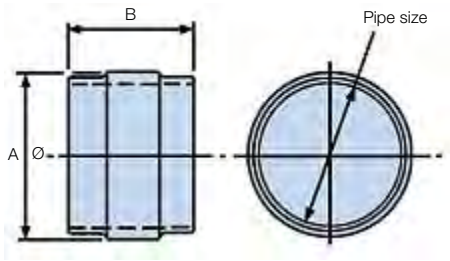
Multiclamp – 12 or 16 holes

1 set of clamping units = 1 pair



Split Bushes

Split bushes are ordered in sets only
i.e. 1 set of bushes = 10 bushes of one size



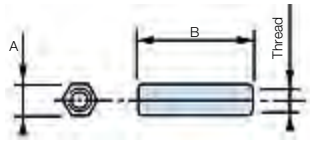
Material Specifications

Zinc plated steel with anti-corrosive, full passivate. Multiclamp can also be multi-stacked using stacking studs and nuts. Series 10 and 16 clamp is supplied in lengths of 603mm and Series 32 in lengths of 1206mm. These can be simply cut to the required lengths for installation.

Note: For stainless steel version please consult Parker.

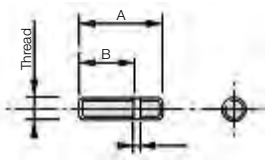
Series 10 will accept pipe or hose diameters from 6mm up to 20mm maximum. Series 16 from 6mm up to 28mm and Series 32 from 10mm up to 50mm. Across the 3 Series, there are 26 different high-quality split rubber bushes to select from to cope with any combination and number of different pipe and hose diameters in the same run.

Stacking Nuts



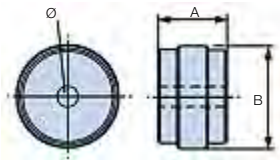
Stacking nuts are ordered in sets only.
i.e. 1 set of stacking nuts
= 50 stacking nuts of one size.

Stacking Studs



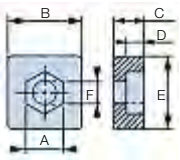
Stacking studs are ordered in sets only. i.e. 1 set of stacking studs
= 50 stacking studs of one size.

Mounting Adaptors



Mounting adaptors are not ordered in sets. i.e. 1 off mounting adaptors
= 1 single piece.

Weld Plate



Weld plates are ordered in sets only.
i.e. 1 set of weld plates
= 10 weld plates.

Multiclamp

Ordering Information - Series 10

Product configurator

Part number	Supersedes	Description	Pack quantity	Dimensions (mm)									Thread	Pack weight
				A	B	C	D	E	F	G	H	Ø		
MC101	MC.10.1	Single clamp	10 pairs	25.0	8.5	38.1	55.0	19.0	38.0			9.0		0.60 Kg
MC102	MC.10.2	Double clamp	10 pairs	25.0	8.5	38.1	93.0	19.0	38.0			9.0		1.00 Kg
MC1016	MC.10.16	16 bay clamp	1 pair	34.0	38.1	25.0	15.0	38.1	601.5	19.0	38.0	9.0		0.80 Kg
MCN10	MC.N.10	Stacking nut	50	11.0	33.0								M8 x 1.25	0.80 Kg
MCS10	MC.S.10	Stacking stud	50	32.0	21.0	2.6							M8 x 1.25	0.50 Kg
MCWP10	MC.WP.10	Weld plate	10	13.3	25.0	10.0	6.3	25.0	8.5					0.35 Kg
MCSB10	MC.SB.10	Standard bolt	50										M8 x 1.25	0.55 Kg
MCB10MO	MC.B.10.MO	Mounting adaptor	1	27.0	25.0							8.7		0.02 Kg

Part number	Supersedes	Description	Pack quantity	Dimensions (mm)		Pipe size		Pack weight
				A	B	(mm)	OD	
MCG105	MC.G.10.5	Split bush	10	25.5	27.0	8	5/16	0.13 Kg
MCG106	MC.G.10.6	Split bush	10	25.5	27.0	10	3/8	0.12 Kg
MCG108	MC.G.10.8	Split bush	10	25.5	27.0	12-14	1/2	0.12 Kg
MCG1010	MC.G.10.10	Split bush	10	25.5	27.0	15-16	5/8	0.10 Kg
MCG1012	MC.G.10.12	Split bush	10	25.5	27.0	18-20	3/4	0.90 Kg
MCG104	MC.G.10.4	Split bush	10	25.5	27.0	6	1/4	0.13 Kg

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Ordering Information - Series 16

Product configurator

Part number	Supersedes	Description	Pack quantity	Dimensions (mm)									Thread	Pack weight
				A	B	C	D	E	F	G	H	Ø		
MC161	MC.16.1	Single clamp	10 pairs	25.0	7.0	50.8	65.0	23.8	47.6			9.0		0.80 Kg
MC162	MC.16.2	Double clamp	10 pairs	25.0	7.0	50.8	116.0	23.8	47.6			9.0		1.60 Kg
MC1612	MC.16.12	12 bay clamp	1 pair	47.0	50.8	25.0	21.0	50.8	608.8	25.0	51.0	9.0		1.00 Kg
MCN16	MC.N.16	Stacking nut	50	11.0	44.0								M8 x 1.25	1.06 Kg
MCS10	MC.S.10	Stacking stud	50	32.0	21.0	2.6							M8 x 1.25	0.50 Kg
MCWP10	MC.WP.10	Weld plate	10	13.3	25.0	10.0	6.3	25.0	8.5					0.35 Kg
MCSB10	MC.SB.10	Standard bolt	50										M8 x 1.25	0.55 Kg
MCB16MO	MC.B.16.MO	Mounting adaptor	1	27.0	36.0							8.7		0.06 Kg

Part number	Supersedes	Description	Pack quantity	Dimensions (mm)		Pipe size		Pack weight
				A	B	(mm)	OD	
MCG165	MC.G.16.5	Split bush	10	35.4	27.0	8	5/16	0.28 Kg
MCG166	MC.G.16.6	Split bush	10	35.4	27.0	10	3/8	0.28 Kg
MCG168	MC.G.16.8	Split bush	10	35.4	27.0	12-14	1/2	0.26 Kg
MCG1610	MC.G.16.10	Split bush	10	35.4	27.0	15-16	5/8	0.22 Kg
MCG1612	MC.G.16.12	Split bush	10	35.4	27.0	18-20	3/4	0.20 Kg
MCG1614	MC.G.16.14	Split bush	10	35.4	27.0	22.0	7/8	0.18 Kg
MCG1616	MC.G.16.16	Split bush	10	35.4	27.0	25.0	1	0.14 Kg
MCG1618	MC.G.16.18	Split bush	10	35.4	27.0	28.0		0.16 Kg
MCG164	MC.G.16.4	Split bush	10	35.4	27.0	6	1/4	0.28 Kg

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Ordering Information - Series 32

Product configurator

Part number	Supersedes	Description	Pack quantity	Dimensions (mm)									Thread	Pack weight
				A	B	C	D	E	F	G	H	Ø		
MC321	MC.32.1	Single clamp	10 pairs	40.0	9.4	76.2	95.0	38.0	76.2			11.1		2.25 Kg
MC322	MC.32.2	Double clamp	10 pairs	41.0	9.4	76.2	171.0	38.0	76.2			11.1		3.82 Kg
MC3216	MC.32.16	16 bay clamp	1 pair	72.0	76.2	40.0	34.0	76.2	1211.0	38.5	77.0	11.0		3.80 Kg
MCN32	MC.N.32	Stacking nut	50	13.0	71.5								M10 x 1.5	1.99 Kg
MCS32	MC.S.32	Stacking stud	50	38.0	22.0	4.0							M10 x 1.5	0.90 Kg
MCWP32	MC.WP.32	Weld plate	10	17.5	32.0	12.0	8.0	32.0	11.0					0.70 Kg
MCSB32	MC.SB.32	Standard bolt	50										M10 x 1.5	1.30 Kg
MCB32MO	MC.B.32.MO	Mounting adaptor	1	40.0	58.0							10.7		0.26 Kg

Part number	Supersedes	Description	Pack quantity	Dimensions (mm)		Pipe size		Pack weight
				A	B	(mm)	OD	
MCG3210	MC.G.32.10	Split bush	10	59.0	44.5	15-16	5/8	1.10 Kg
MCG3212	MC.G.32.12	Split bush	10	59.0	44.5	18-20	3/4	1.10 Kg
MCG3216	MC.G.32.16	Split bush	10	59.0	44.5	25	1	1.00 Kg
MCG3218	MC.G.32.18	Split bush	10	59.0	44.5	28-30		1.00 Kg
MCG3220	MC.G.32.20	Split bush	10	59.0	44.5	32-34	1 1/4	0.80 Kg
MCG3224	MC.G.32.24	Split bush	10	59.0	44.5	35-38	1 1/4	0.80 Kg
MCG3232	MC.G.32.32	Split bush	10	59.0	44.5	50	2	0.40 Kg
MCG326	MC.G.32.6	Split bush	10	59.0	44.5	10	3/8	1.30 Kg
MCG328	MC.G.32.8	Split bush	10	59.0	44.5	12-14	1/2	1.20 Kg
MCG3214	MC.G.32.14	Split bush	10	59.0	44.5	22	7/8	1.00 Kg
MCG3226	MC.G.32.26	Split bush	10	59.0	44.5	42		0.60 Kg

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

How to 'build' Multiclamp

Inline Check Valves

Specification

Construction:
Steel UNI 5105.

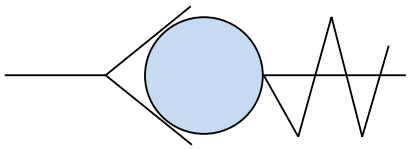
Ball and spring:
Chrome finished steel.

Retainer:
Nylon.

Flow rates:
From 20 l/min to 150 l/min.

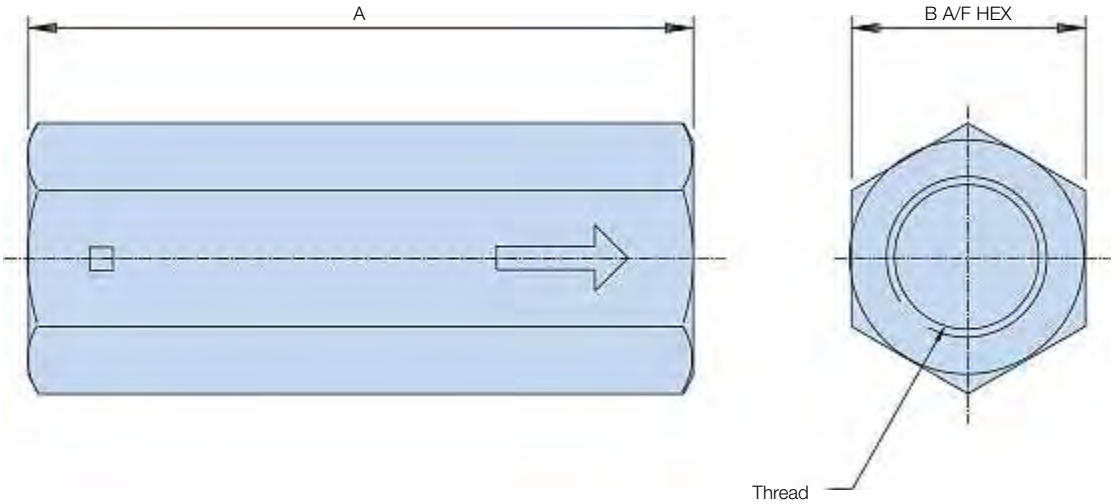
Max. working pressure:
350 bar.

Valve crack pressures:
0.35 and 4.5 bar.



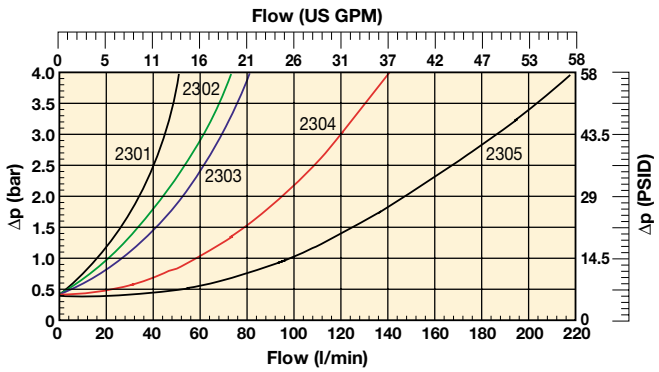
Circuit symbol

Installation Details



Technical Data

Pressure Drop Flow Curves



Ordering Information

Standard products table

Part number	Flow l/min	Cracking pressure bar	Thread G	A mm	B mm	Weight Kg
2301	20	0.35	1/4	54	19	0.09
2302	30	0.35	3/8	66	24	0.17
2303	50	0.35	1/2	77	30	0.32
2304	100	0.35	3/4	88	36	0.48
2305	150	0.35	1	108	46	0.99
2311	20	4.50	1/4	54	19	0.09
2312	30	4.50	3/8	65	24	0.17
2313	50	4.50	1/2	77	30	0.32
2314	100	4.50	3/4	88	36	0.48
2315	150	4.50	1	108	46	0.99

Single Station Gauge Isolator Valves

Specification

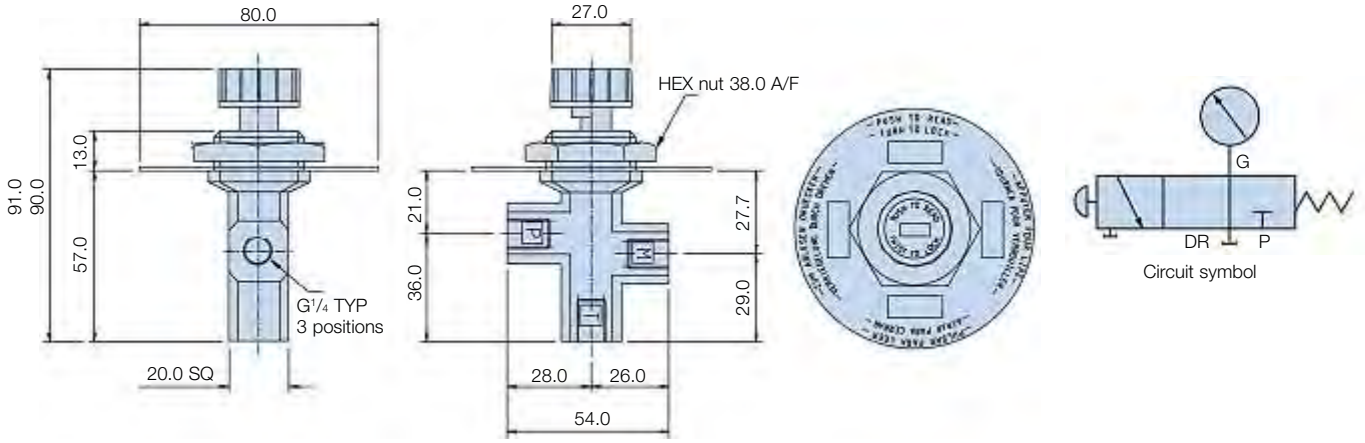
Construction:
Single Station: Cast iron and steel. Knurled aluminium knob with 'Twist to lock' or 'push to read' type.

Max. working pressure:
350 bar.

Port size:
Single Station: G1/4.

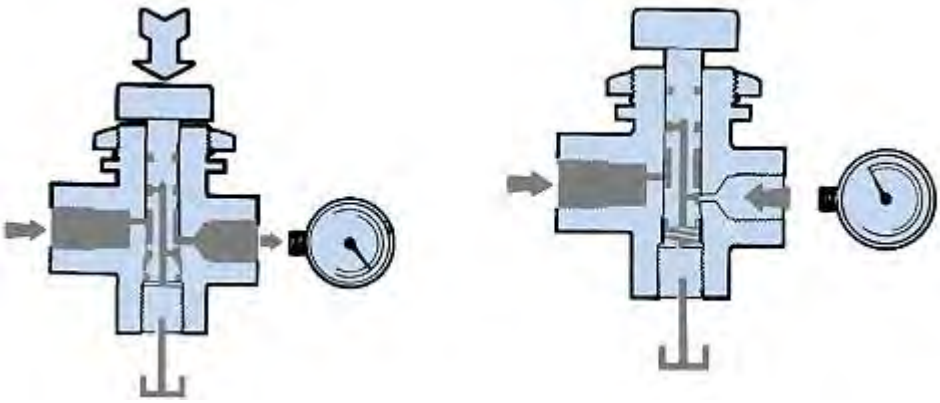
Weight:
Single Station: 0.90 Kg.

Single Station Installation Details



Operation Details

Single Station



Ordering Information

Standard products table

Part number	Description	Weight
GI1486	Single station gauge isolator "twist to lock" type	0.90 Kg
GI1414	Single station gauge isolator "push to read" type	0.90 Kg

63mm Dia. Pressure Gauges

Specification

Construction:
Case: Natural finish stainless steel.
Window: Non-splintering clear acrylic glass.
Movement: Cu alloy.
Dial: White plastic, with pointer stop pin.
Pointer: Black plastic.

Liquid filling:
Glycerine 99.7%.

Working pressure:
Max 75% of the full scale value.

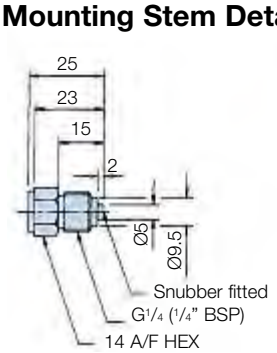
Process temperature:
+ 60°C maximum.

Accuracy:
1.6% FSD.

Wetted parts connector:
Copper alloy.

Bourdon tube:
< 60 bar = Cu alloy, C-type, soft soldered.
> 60 bar = Cu alloy, helical type, soft soldered.

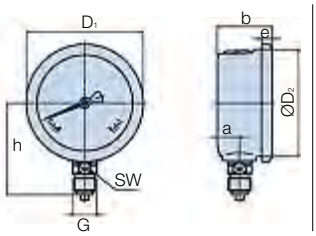
Mounting Stem Detail



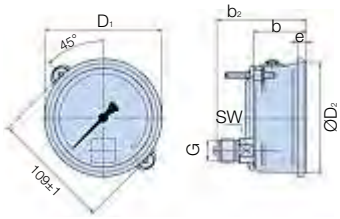
Note: It is recommended that all glycerine gauges should be mounted in the vertical position with gauge case relief valve uppermost. Pressure range up to 1000 bar available.

Installation Details

Bottom Connection



Panel Mounting (Lower Back)



Dimensions (mm) — Bottom Connection

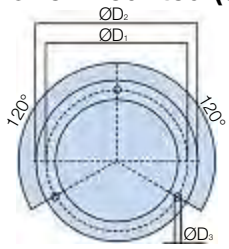
a	b ±0.5	D1	D2	e	G	h ±1	SW	Weight Kg
13	32	68	62	6.5	G¼	54	14	0.21

Dimensions (mm) — Panel Mounting (Lower Back)

b ±0.5	b2 ±1	D1	D2	e	G	SW	Weight Kg
32	56	68	62	6.5	G¼	14	0.21

Note 1: Panel cut-out 64.5 ±0.5
Note 2: 13mm on the outside radius required to allow for fixing clamp.

Panel Mounted (3-hole flange)



Note 1: Gauge dimensions as for panel mounting option above with flange as shown below.
Note 2: Panel cut-out for 3-hole mounting 67±0.3.

Dimensions (mm)

D1	D2	D3
75	85	3.6

Ordering Information

Bottom Connection

Part number	Supersedes	Pressure range	Connector type
PGB0631010	PGB.0631.010	0-10 bar	G¼ Bottom
PGB0631016	PGB.0631.016	0-16 bar	G¼ Bottom
PGB0631025	PGB.0631.025	0-25 bar	G¼ Bottom
PGB0631040	PGB.0631.040	0-40 bar	G¼ Bottom
PGB0631060	PGB.0631.060	0-60 bar	G¼ Bottom
PGB0631100	PGB.0631.100	0-100 bar	G¼ Bottom
PGB0631160	PGB.0631.160	0-160 bar	G¼ Bottom
PGB0631250	PGB.0631.250	0-250 bar	G¼ Bottom
PGB0631400	PGB.0631.400	0-400 bar	G¼ Bottom
PGB0631600	PGB.0631.600	0-600 bar	G¼ Bottom
PGB0631004	PGB.0631.004	0-4 bar	G¼ Bottom

Panel Mounting

Part number	Supersedes	Pressure range	Connector type
PGC0631010	PGC.0631.010	0-10 bar	G¼ Panel
PGC0631016	PGC.0631.016	0-16 bar	G¼ Panel
PGC0631025	PGC.0631.025	0-25 bar	G¼ Panel
PGC0631040	PGC.0631.040	0-40 bar	G¼ Panel
PGC0631060	PGC.0631.060	0-60 bar	G¼ Panel
PGC0631100	PGC.0631.100	0-100 bar	G¼ Panel
PGC0631160	PGC.0631.160	0-160 bar	G¼ Panel
PGC0631250	PGC.0631.250	0-250 bar	G¼ Panel
PGC0631400	PGC.0631.400	0-400 bar	G¼ Panel
PGC0631004	PGC.0631.004	0-4 bar	G¼ Panel
PGC0631600	PGC.0631.600	0-600 bar	G¼ Panel

Panel Mounted (3-hole flange)

Part number	Supersedes	Pressure range	Connector type
PGF0631060	PGF.0631.060	0-60 bar	G¼ Panel Flange
PGF0631100	PGF.0631.100	0-100 bar	G¼ Panel Flange
PGF0631160	PGF.0631.160	0-160 bar	G¼ Panel Flange
PGF0631250	PGF.0631.250	0-250 bar	G¼ Panel Flange
PGF0631400	PGF.0631.400	0-400 bar	G¼ Panel Flange
PGF0631004	PGF.0631.004	0-4 bar	G¼ Panel Flange
PGF0631010	PGF.0631.010	0-10 bar	G¼ Panel Flange
PGF0631016	PGF.0631.016	0-16 bar	G¼ Panel Flange
PGF0631025	PGF.0631.025	0-25 bar	G¼ Panel Flange
PGF0631040	PGF.0631.040	0-40 bar	G¼ Panel Flange
PGF0631600	PGF.0631.600	0-600 bar	G¼ Panel Flange

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.
*Note 3: Any subsequent changes to gauge accuracy will be notified.

100mm Dia. Pressure Gauges

Specification

Construction:
Case: BS 304 S15 stainless steel.
Window: Acrylic.
Movement: Brass.
Dial: White aluminium.
Pointer: Black aluminium.

Liquid filling:
Glycerine 98%.

Working pressure:
Full scale value.

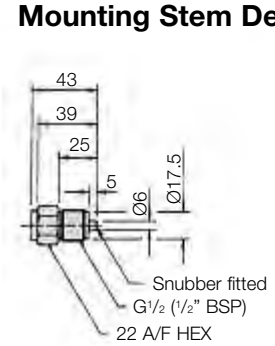
Process temperature:
+ 60°C maximum.

Accuracy:
1.0% FSD.

Wetted parts connector:
Copper alloy.

Bourdon tube:
< 100 bar = Cu alloy, c-type, soft soldered.
> 100 bar = stainless steel 1.4571, helical type, brazed.

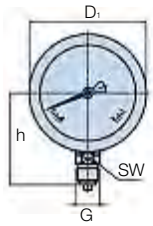
Mounting Stem Detail

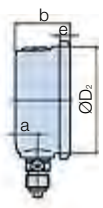


Note: It is recommended that all glycerine gauges should be mounted in the vertical position with gauge case relief valve uppermost.

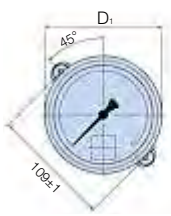
Installation Details

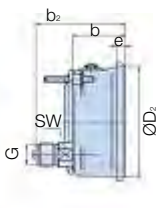
Bottom Connection





Panel Mounting (Lower Back)





Dimensions (mm) Bottom Connection

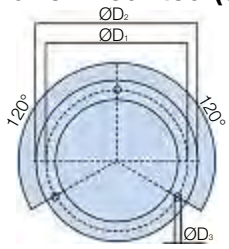
a	b ±0.5	D1	D2	e	G	h ±1	SW	Weight Kg
15.5	48	107	100	8	G½	87	22	0.80

Dimensions (mm) Panel Mounting (Lower Back)

b ±0.5	b2 ±1	D1	D2	e	G	SW	Weight Kg
48	81.5	107	100	8	G½	22	0.80

Note 1: Panel cut-out 102 ±1.0
Note 2: 13mm on the outside radius required to allow for fixing clamp.

Panel Mounted (3-hole flange)



Note 1: Gauge dimensions as for panel mounting option above with flange as shown below.
Note 2: Panel cut-out for 3-hole mounting 104±0.5.

Dimensions (mm)

D1	D2	D3
116	132	4.8

Ordering Information

Bottom Connection

Part number	Supersedes	Pressure range	Connector type
PGB1001250	PGB.1001.250	0-250 bar	G½ Bottom
PGB1001400	PGB.1001.400	0-400 bar	G½ Bottom
PGB1001010	PGB.1001.010	0-10 bar	G½ Bottom
PGB1001016	PGB.1001.016	0-16 bar	G½ Bottom
PGB1001025	PGB.1001.025	0-25 bar	G½ Bottom
PGB1001040	PGB.1001.040	0-40 bar	G½ Bottom
PGB1001060	PGB.1001.060	0-60 bar	G½ Bottom
PGB1001100	PGB.1001.100	0-100 bar	G½ Bottom
PGB1001160	PGB.1001.160	0-160 bar	G½ Bottom
PGB1001600	PGB.1001.600	0-600 bar	G½ Bottom
PGB10011000	PGB.1001.1000	0-1000 bar	G½ Bottom

Panel Mounting

Part number	Supersedes	Pressure range	Connector type
PGE1001010	PGE.1001.010	0-10 bar	G½ Panel
PGE1001016	PGE.1001.016	0-16 bar	G½ Panel
PGE1001025	PGE.1001.025	0-25 bar	G½ Panel
PGE1001040	PGE.1001.040	0-40 bar	G½ Panel
PGE1001060	PGE.1001.060	0-60 bar	G½ Panel
PGE1001100	PGE.1001.100	0-100 bar	G½ Panel
PGE1001160	PGE.1001.160	0-160 bar	G½ Panel
PGE1001250	PGE.1001.250	0-250 bar	G½ Panel
PGE1001400	PGE.1001.400	0-400 bar	G½ Panel
PGE1001600	PGE.1001.600	0-600 bar	G½ Panel
PGE10011000	PGE.1001.1000	0-1000 bar	G½ Panel

Panel Mounted (3-hole flange)

Part number	Supersedes	Pressure range	Connector type
PG.1001250	PGF.1001.250	0-250 bar	G½ Panel Flange
PGF1001400	PGF.1001.400	0-400 bar	G½ Panel Flange
PGF1001010	PGF.1001.010	0-10 bar	G½ Panel Flange
PGF1001016	PGF.1001.016	0-16 bar	G½ Panel Flange
PGF1001025	PGF.1001.025	0-25 bar	G½ Panel Flange
PGF1001040	PGF.1001.040	0-40 bar	G½ Panel Flange
PGF1001060	PGF.1001.060	0-60 bar	G½ Panel Flange
PGF1001100	PGF.1001.100	0-100 bar	G½ Panel Flange
PGF1001160	PGF.1001.160	0-160 bar	G½ Panel Flange
PGF1001600	PGF.1001.600	0-600 bar	G½ Panel Flange
PGF10011000	PGF.1001.1000	0-1000 bar	G½ Panel Flange

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.
*Note 3: Any subsequent changes to gauge accuracy will be notified.

Notes

Portable Particle Counter

LaserCM

Fluid Condition Monitoring

Portable Particle Counter

LaserCM

Features & Benefits

Test time:	2 minutes
Particle counts:	2+, 5+, 15+, 25+, 50+ and 100+ microns 4+, 6+, 14+, 21+, 38+ and 70+ microns(c)
International codes:	ISO 7-22, NAS 0-12
Data retrieval:	Memory access gives test search facility
Max. working pressure:	420 bar
Max. flow rate:	400 l/min when used with system 20 Sensors. Higher with single point sampler (consult Parker)
Working conditions:	LaserCM will operate with the system working normally
Computer compatibility:	Interface via RS232 connection @ 9600 baud rate.

- Special 'diagnostics' are incorporated into the LaserCM microprocessor control to ensure effective testing.
- Routine contamination monitoring of oil systems with LaserCM saves time and saves money.
- Contamination monitoring is now possible while machinery is working - LaserCM saves on production downtime.
- Data entry allows individual equipment test log details to be recorded.
- Data retrieval of test results from memory via hand set display.
- Automatic test cycle logging of up to 300 tests can be selected via hand set display.
- Totally portable, can be used as easily in the field as in the laboratory.
- Automatic calibration reminder.
- Instant, accurate results achieved with a 2 minute test cycle.
- Data entry allows individual equipment footprint record.
- Data graphing selectable via the integral printer.
- Auto 300-test cycle logging via LCD handset input.
- RS232 serial port computer interface.
- Limit level output to control peripheral equipment such as off-line filtration via internal relay limit switches.
- Auto-testing allows for the conducting of automatic sequencing tests on flushing systems for example.
- Optional bar code swipe wand to allow handset data loading.
- Worldwide service and technical support.
- Re-calibration - Annual certification by an approved Parker Service Centre.

Typical Applications

- Construction machinery
- Industrial plant
- Hydraulic equipment & system manufacturers
- Research & testing institutes
- Offshore & power generation
- Marine
- Military equipment applications

Parker LaserCM Portable Particle Counter.

With 15 years experience in manufacturing the world's best selling 'white light' portable particle counter – CM20, the progression to the LaserCM with its opto-mechanical, continuous wave single point source laser (SPSL) is both a natural and customer driven development.

Specification

Automatic Particle Counters (APC's), have been widely used for many years in condition monitoring of hydraulic fluids. However, it is only recently that APC's have become flexible enough to enable the instruments to be taken out of the laboratory and used on-line in order to obtain the most credible form of results.

Unusually, the move from fixed laboratory use, to portable field use has not been at the expense of accuracy or user flexibility, but has actually enabled the instruments to be used over a wider range of applications and situations.

The most common monitoring technique used in APC's is that of light obscuration or light blockage. Here, a focused light source is projected through a moving column of oil, (in which the contaminants being measured are contained), causing an image of the contaminant to be projected on to a photo diode cell, (changing light intensity to an electrical output).

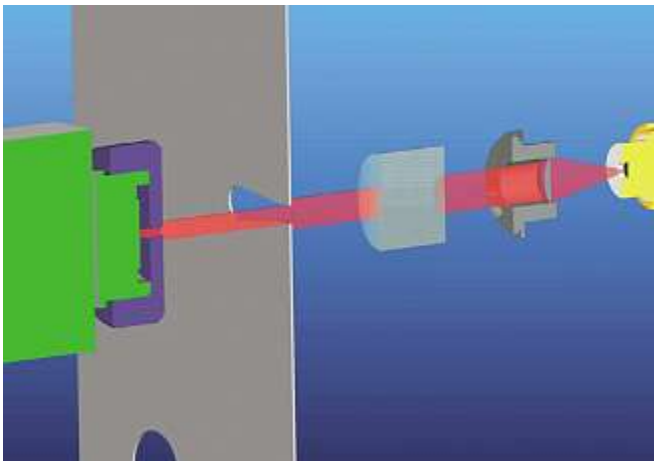
The electrical output of the photo diode cell will vary in accordance with the size of the particles contained in the column of oil; the larger the particle, the bigger the change in the photo diode electrical output.

On-line APC's must be able to test the oil sample at whatever cleanliness it is delivered to the machine. Parker therefore had to develop technology to ensure the on-line APC was able to test a sample without the conventional laboratory technique which requires dilution - a practice that would have been simply impossible with a portable unit.

By careful design and window sizing, gravimetric levels as high as 310mg of dirt per litre, (equivalent to up to 4 million particles >5 micron per 100 ml), can be achieved without making the instrument susceptible to counter saturation.

These high saturation point on-line APC's, whilst losing none of the accuracy of their laboratory counterparts, enable particle counting to be carried out quickly and accurately.

A focused light source is projected through a moving column of oil.



Laser Optical Sensing

Core technology that proves itself in LaserCM

The LaserCM portable particle counter features microprocessor controlled optical scanning for accurate contaminant measurement with a calibration range from ISO 7 to ISO 22 with no counter saturation.

How does LaserCM work?

- The particles are measured by a photo diode that converts light intensity to a voltage output which is recorded against time.
- As the particle moves across the window the amount of light lost is proportional to the size of the particle. This reduction in voltage is measured and recorded.
- This "voltage" lost relates directly to the area of the particle measured, is changed into a "positive" voltage and then in turn changed into a capacitance value.
- This value is counted and stored in the LaserCM computer in one of 6 channels, >2, >5, >15, >25, >50 and >100µ according to particle size.
- Readouts are displayed on the hand-held LCD in the accepted ISO and NAS standards ready for hard copy printing or RS232 computer download.
- The on-board computer allows storage of up to 300 test results.

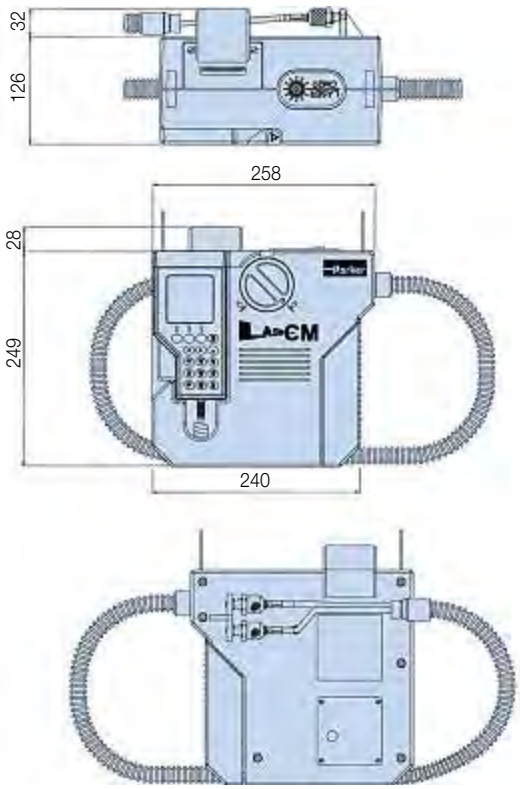
Portable Particle Counter

LaserCM

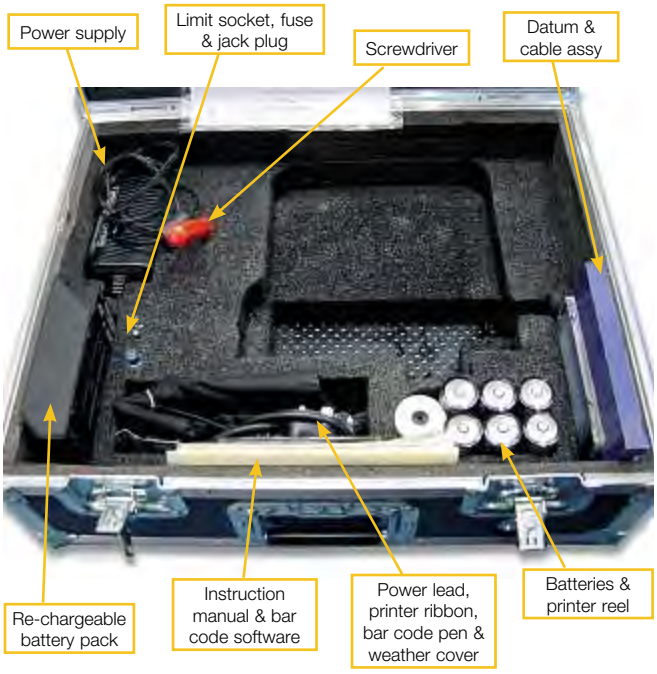
Specification

Description	LaserCM (LCM20.2021)	LaserCM (LCM20.2061)
Lexan, structural foam and ABS case	●	●
ABS handheld display	●	●
Mechanical composition – Brass, plated steel, stainless steel and aluminium	●	●
Fluorocarbon seals	●	●
Perfluoroelastomer seals		●
Nylon hoses (kevlar braided microbore)	●	●
Stainless steel armoured hose ends	●	●
1.2m fluid connection hose	●	●
System 20 sensors. Higher with single point sampler	●	●
Rechargeable battery pack	●	●
12Vdc power supply	●	●
Fast blow fuse	●	●
Unique optical scanning system	●	●
Bonded glass optical window enclosed in SS plate	●	●
Micron channels analysis (2+,5+,15+,25+,50+ & 100+)	●	●
Analysis range ISO 7 to 22 incl. (NAS 0 to 12)	●	●
32 character dot matrix LCD. Alpha numeric keypad	●	●
Data retrieval	●	●
Calibration to ISO standards*	●	●
Viscosity range 2 to 100 cSt. 500 cSt.with SPS	●	●
Operating temp.+5 to +80°C	●	●
Ambient temp.+5 to +40°C	●	●
2 minute test completion time	●	●
Memory store – 300 test memory	●	●
12Vdc regulated power supply input	●	●
Battery operated 6 x 1.5 D cells	●	●
Phosphate Ester group compatibility		●
Mineral oil & petroleum based fluid compatibility	●	●
Up to 420 bar (6000 psi)	●	●
Integral 16 column printer	●	●
RS232 computer interface	●	●
Astra board case weight – (Kg)	5	5
Unit weight – (Kg)	8	8
DATUM software and cable link pack	●	●
Weather protector cover	●	
CE certified	●	●
Auto logging	●	●

*Note: In compliance with international standards, all Parker portable particle counters can meet the ISO Medium test dust standards. The LaserCM's, in addition to the complete range of Condition Monitoring products, are capable of achieving certification to ISO 4406:1999 and with traceability to ISO 11171 for SRM 2806, via ISO 11943.



Commissioning Kit


Power supply
Limit socket, fuse & jack plug
Screwdriver
Datum & cable assy
Re-chargeable battery pack
Instruction manual & bar code software
Power lead, printer ribbon, bar code pen & weather cover
Batteries & printer reel

Operation

Operating the Parker LaserCM is as simple as pressing the start button and turning the dial. The test procedure is automatic and in the case of the LaserCM takes no more than 2 minutes to complete.

LaserCM makes the difference in industry

Fully accredited to BS EN 60825:1992 and IEC 60825-1 (safety of laser products) Standards, accredited to USA Standards and achieving full ISO certification. LaserCM offers users advanced laser technology, a fast, dynamic and on-line 2 minute system test cycle. A LaserCM Aggressive Fluids model is also available, suitable for monitoring corrosive fluids such as phosphate ester based lubricants used in commercial aviation.

MTD calibration

Laser CM20 MTD Calibration variants are certified via a primary ISO 11171 calibrated automatic particle counter. All MTD Laser CM20's achieve ISO 4406:1999 criteria, via ISO 11943.

LCM20
Using SPS

Understanding MTD

ACFTD (Air Cleaner Fine Test Dust) was formatted in the 1960's, but is no longer being produced. The obsolescence of this dust has led to the adoption of a new dust MTD.

MTD (Medium Test Dust) having a particle size distribution close to ACFTD was selected as a replacement. However, MTD produced results somewhat different to ACFTD, so the NIST (National Institute of Standards & Technology) undertook a project to certify the particle size distribution of ISO MTD.

The result was particle sizes below 10µm were greater than previously measured.

Particles sizes reported based on NIST would be represented as µm (c), with "c" referring to "certified". Therefore the CM20 reported sizes are as follows:

ACFTD	MTD
2µ	4µ (c)
5µ	6µ (c)
15µ	14µ (c)
25µ	21µ (c)
50µ	38µ (c)
100µ	70µ (c)

MTD offers true traceability, improved particle size accuracy and better batch to batch reproduction.

Portable Particle Counter

LaserCM

Why On-Site Fluid Contamination Monitoring

- Certification of fluid cleanliness levels.
- Early warning instrument to help prevent catastrophic failure in critical systems.
- Immediate results with laboratory accuracy.
- To comply with customer cleanliness requirements and specifications.
- New equipment warranty compliance.
- New oil cleanliness testing.

Datum Data Management

DATμm

Datum, dedicated software, provides the link between a Laser CM20, System 20 EM20 or the H_2Oil - Water in Oil and your computer management system.

Features:

- Windows based, Icon driven program
- Full graphic output
- Tables/results download
- Trend analysis and predictive maintenance
- Auto test communication allows Datum to control particle counter testing and water in oil monitoring
- Certification creator using downloaded data
- Customer customised fields

16-column printer for hard copy data. A feature of the LaserCM is the on-board printout data graphing option developed to support predictive maintenance procedures.

Laser CM Test

ON LINE TEST

TEST NUMBER 022

	D M Y
Date	04-03-06
Time	15-52
ISO:	20/15/09

Count / 100ml

>4μ (c)	820721
>6μ (c)	31564
>14μ (c)	314
>21μ (c)	64
>38μ (c)	14
>70μ (c)	0

NOTES

ISO 4406 - 1996
(MTD calibration comes under ISO 4406 - 1999 revised standards)

Laser CM Test

ON LINE TEST

TEST NUMBER 022

	D M Y
Date	04-03-06
Time	15-52
NAS CLASS:	7

Count / 100ml

4/6μ (c)	789157
6/14μ (c)	31250
NAS CLASS	7
14/21μ (c)	250
NAS CLASS	3
21/38μ (c)	50
NAS CLASS	3
38/70μ (c)	14
NAS CLASS	4
>70μ (c)	0
NAS CLASS	0

NOTES

Correlation to NAS 1638

Introducing the new LCM ‘Classic’

There is a new addition to the proven range – the LCM ‘Classic’. Only available from Parker, the ‘Classic’ retains all the technology that made the LaserCM one of the most accurate, reliable and popular portable particle counters available.

Our design engineers have re-configured the LaserCM specification in a way that has reduced our manufacturing costs. These savings have been passed onto LCM ‘Classic’ customers.

How have we done this?

First we talked to our existing customers and then to the engineers and maintenance operatives to find out the features that make the LaserCM a unique predictive maintenance instrument.

Then, we removed peripheral items such as the aluminium case and all the accessories, so a customer receives the monitor, with a CD user guide, professionally and securely boxed. One thing that has not altered is laser accuracy and laser reliability. Our in-house software engineers have re-configured the EPROM, removing Data programming, User ID, Automatic Testing, Data retrieval, Alarm level settings, the barcode pen and Graph printing functions to reduce costs still further without in any way reducing the efficiency of the monitor. The LCM ‘Classic’ is an instrument to be proud of.

Ordering Information (LaserCM and ‘Classic’ LaserCM)

Standard products table

Part number	Supersedes	Description
LCM202022	N/A	MTD calibrated
LCM202026	N/A	Classic unit - MTD calibrated
B84702	B.84.702	Printer paper (5 rolls)
P843702	N/A	Printer ribbon
B84729	B.84.729	12Vdc power supply
B84609	B.84.609	Re-chargeable battery pack
P849613	N/A	Weather protector cover
B84779	B.84.779	Datum software pack
B84708	B.84.708	Cable and adaptor

Note 1: Part numbers featured with bold highlighted codes will ensure a ‘standard’ product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Product configurator

Model	Fluid type		Options	
LCM2020	**2**	Hydraulic mineral	**1**	ACFTD calibrated
LCM2020	**6**	Skydrol	**2**	MTD calibrated
			3	ACFTD calibrated + bar code pen
			4	MTD calibrated + bar code pen
			5	Classic unit - ACFTD calibrated
			6	Classic unit - MTD calibrated

Note 1: Part numbers featured with bold highlighted codes will ensure a ‘standard’ product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Notes

Universal Bottle Sampler

Universal Bottle Sampler

Features & Benefits

- Simple operation
- Efficient testing procedure
- Clean and contamination free sampling
- Available for both mineral based and aggressive fluids
- Further advances the LCM20's flexibility into laboratory bottle sampling environments
- Can accept various different sized bottles
- Minimal working parts
- Internal auto setting fuse for overload protection
- Simple maintenance procedures

Typical Applications

- Batch sampling
- Aircraft rig certification
- Oil research
- Laboratory testing
- Transfer line monitoring

Providing The Dynamic Link To All Portable Particle / Water Counters.

The UBS off-line, has microprocessor technology to recognise and adjust to the connecting monitor including the LaserCM and Water in Oil Monitor.

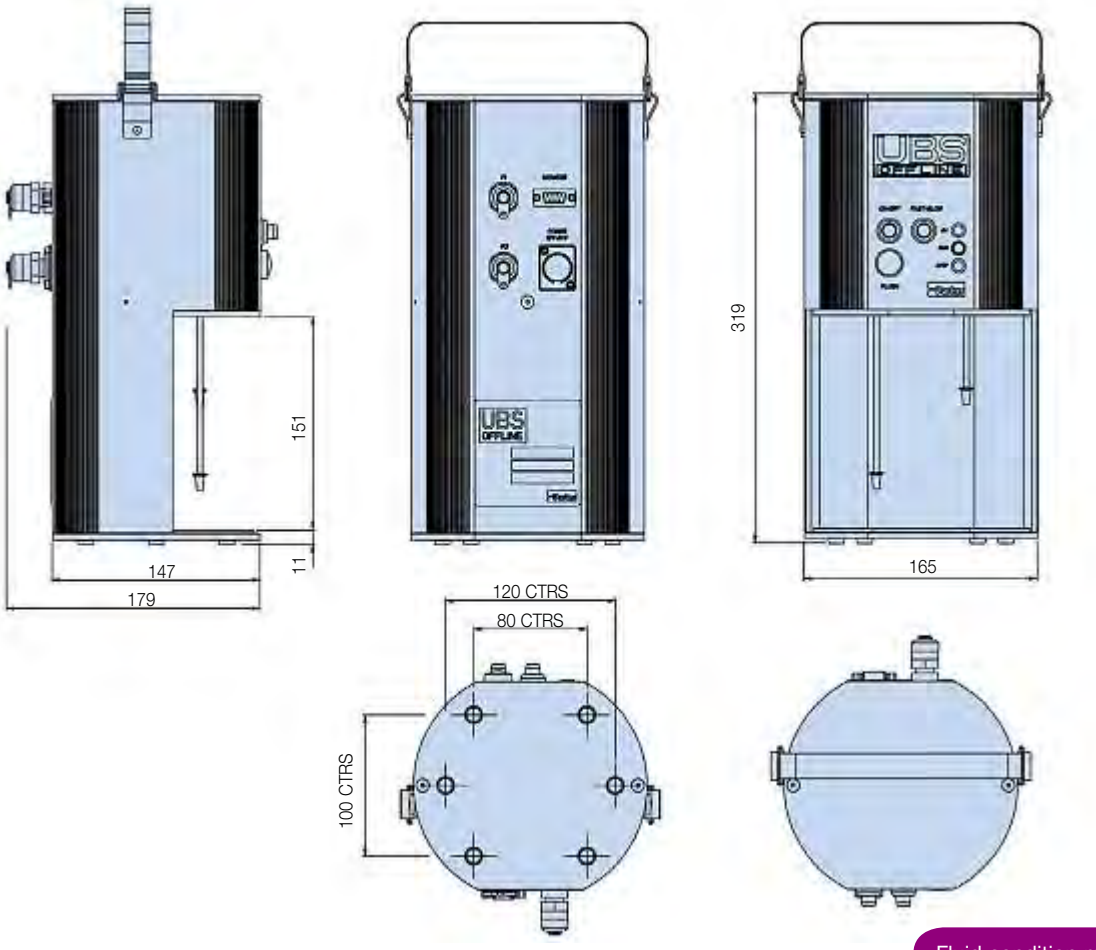
Simple To Use UBS

The oil sample is drawn into the UBS Off-line where it is secured, free from further contamination, in a bottle together with a clean waste bottle by a peristaltic, self-priming pump. Simple operation and efficient testing are assured once the UBS Off-line is connected to any of the CM monitors, and powered up using it's own power source. The oil sample requires agitation and de-gassing before carrying out the contamination test. A de-gassing kit option is available and consists of a vacuum chamber and pump. (Standard with UBS.9002)

Specification

Description	UBS offline
Viscosity range 2 to 250 cSt	●
Operating temp +5 to +80°C	●
Test time 2m15s / 4m15s (Flush 2m)	●
12 Vdc power supply	●
Extruded aluminium construction	●
Unit weight - (Kg)	4
Mineral oil and petroleum based compatibility	Fluorocarbon seal
Phosphate Ester group compatibility	EPDM seals
CE certified	●
Military approved	●
Manual operation	●
Bottle pack	●
De-gassing chamber	●
Manual	●
Sample tube pack	●
Interface cable to LCM20, H_2Oil etc.	●

Installation Details



Universal Bottle Sampler

Usage Specifications

System Flow Rate

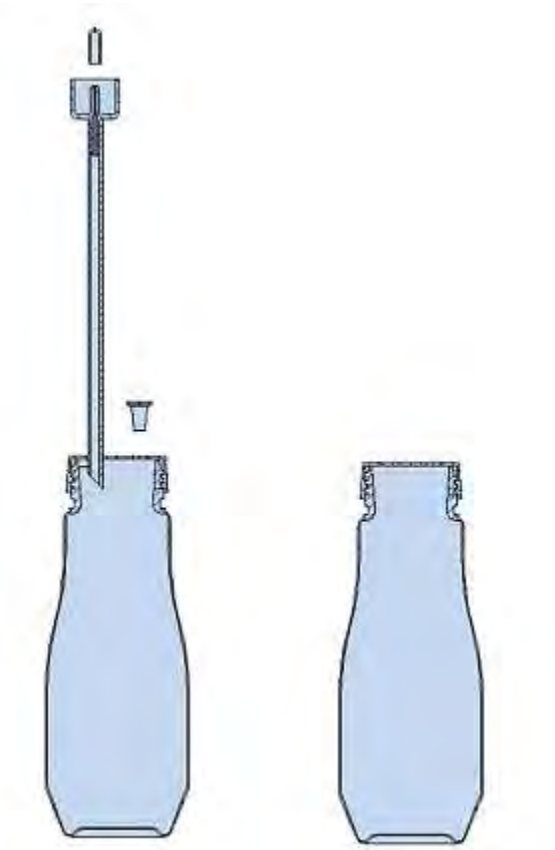
Samples are best taken from a point in the system where the flow is TURBULENT (Reynolds No. greater than 4000). The turbulent flow creates a mixing action. Where flow is streamline or LAMINAR, larger particulate may tend to settle toward the lower pipe surface and not be sampled.

System Condition Changes

Changes in the system operating condition, flow, temperature, pressure or vibration, can result in previously sedimented contaminant being retrained into the flowing oil. It is also possible that these changes may cause partially contaminated filter elements to shed particulate into the system. Samples should, therefore, be extracted when the system is in a steady state condition and the result less likely to be distorted by contaminant peaks.

There are a number of proprietary sampling valves available which adhere to good theoretical principles. However, they do tend to generate a level of precision and cost which is unnecessary for trend monitoring.

Sampling points should enable extraction of a sample without changing the system's condition. Fine control needle valves are not desirable, as they have a tendency to silt up under some operating conditions, causing the distribution of contaminants in the fluid to be changed. The sampling port should be protected to maintain cleanliness and thoroughly flushed before collecting the sample for analysis. Allow sufficient airspace in the bottle to enable 80% fill.



B.89.911 x 50 = B.89.910

B.89.907

Bottle Cleanliness

It is preferable that bottles have sealing screw caps and both parts are cleaned to a suitable level in accordance with ISO3722.

The bottle should not contain more than one tenth the number of particles per 100ml than are expected to be monitored. Standard Parker bottles are supplied clean to ISO13/11 (NAS Class 4) and should not be used to accurately count oils cleaner than ISO 15/12 (NAS Class 6) although they may be used for "trend monitoring" at lower levels.

The bottle should remain capped until time of sample filling and re-capped immediately afterwards.

Sample Mixing

Sedimentation of contaminant in a sample will occur, the rate of which is dependent upon both fluid and particle characteristics.

Samples should be analysed, without delay, once agitated and de-gassed.

Ordering Information

Standard products table

Part number	Description
UBS9002	Universal bottle sampler (includes aluminium case and accessories)
UBS9003	Universal bottle sampler
UBS9004	Aggressive universal bottle sampler
UBS9005	Aggressive universal bottle sampler (Includes aluminium case and accessories)

Accessories

Part number	Supersedes	Description
B89907	B.89.907	Sample bottle pair with plain cap
B89911	B.89.911	Sample bottle pair with oil extraction hose
B89910	B.89.910	Sample bottle pack (50 x B89911)
S840054	N/A	Power supply and socket
S890005	N/A	De-gassing chamber and pump
B89603	B.89.603	De-gassing chamber only
B89902	B.89.902	Cable and adaptor

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Notes

Single Point Sampler

SPS

Single Point Sampler

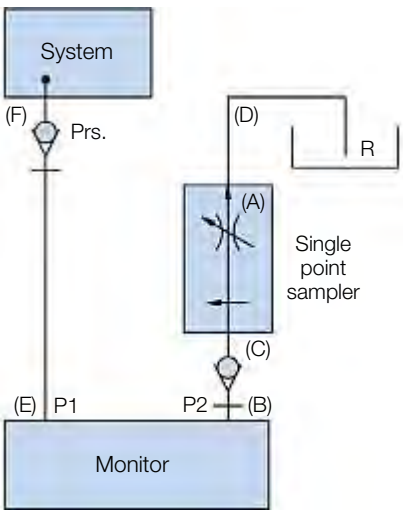
SPS

Features & Benefits

The Single Point Sampler provides a means to connect a CM20 or H_2Oil to a single pressure test point and balance the differential pressure across the system, to provide a controlled flow of oil into the monitor and away into a waste oil receptacle.

- Lightweight, compact and easy to use design
- Fingertip operated control valve even at high pressures
- 420 bar (6,000PSI) rated
- Facilitates testing from large diameter pipes
- Capability to test up to 500cSt viscosity oils (pressure permitting)
- Pressure compensated flow control mechanism
- Possible to control the valve with the same level of accuracy whether the device is operating at high or low pressure
- Capable of allowing a flow rate in excess of 10ml/min when operating at any viscosity within the product specification
- Suitable for fluid temperatures from +5°C to +80°C (+41°F to +176°F)
- High quality polished finish. (stainless steel/ aircraft grade aluminium)
- Capable of working with a CM20 or H_2Oil connected into a system via the standard one metre extension hose kit
- Suitable for use with mineral and biodegradable oils, petroleum based and phosphate ester fluids
- Phosphate ester version utilises the $^5/_8$" BSF HSP style fitting
- Designed so that it meets the lowest possible level of magnetic permeability
- Supplied with accessories kit
- It will maintain the set flow rate between upper and lower limits within a 100 bar inline pressure change
- Clear product identification to ensure that it is connected correctly. (i.e. downstream of the CM20 or H_2Oil)

Connection Instructions



1. Ensure valve is closed (A).
2. Connect P2 on monitor (B) to P2 on Single Point Sampler (SPS) (C).
3. Connect drain line on SPS (D).
4. Connect P1 of monitor (E) to the system (F).
5. The SPS is ready to operate.
6. Open valve (A) slowly until the oil flows continuously from the drainline (D).
7. Switch on monitor and begin testing.

LCM20 Only

Carry out flow test as shown in the manual. If test is showing below Δt 3.6°C then carry out test as normal. If, however, test is above Δt 3.6°C then increase oil flow by turning valve (A) anticlockwise and then carry out flow test. Do this until Δt is below 3.6°C and carry out test as normal once this is achieved.

WARNING! Ensure that SPS valve is closed and monitor is connected to the SPS BEFORE connection to system.

Specification

Fluid compatibility:
Mineral oil and petroleum based fluids (standard version).
Aggressive fluid (dual seal version) for other fluids consult Parker Hannifin.

Seals:
Fluorocarbon or Perfluoroelastomer.

Maximum working pressure:
420 bar (6000 psi).

Weight:
500 grams max. (Not including hoses).

Packaging standard:
Cardboard carton (military usage - plastic carry case).

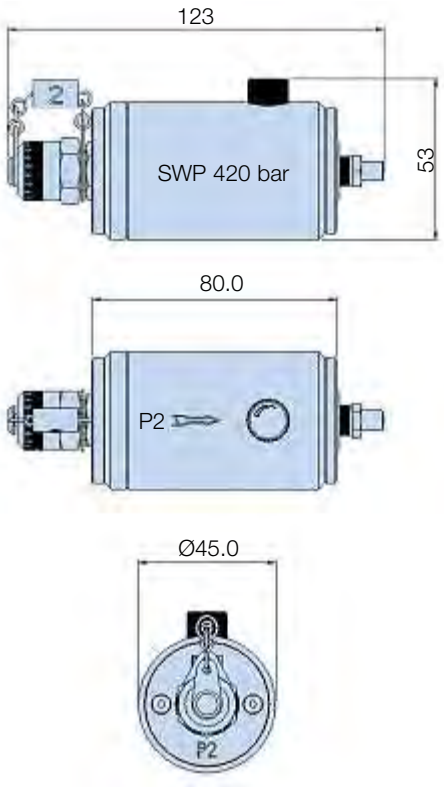
Unit size:
45mm dia x 123mm long.

System connection:
Standard - minimess M16 (G1/4" BSP) with cap,
Aggressive - 5/8" BSF HSP.

Operating temp range:
+5°C to +80°C (+41°F to +176°F).

Storage temperature range:
-26°C to +80°C (-15°F to +176°F).

Construction:
Body: Aluminium BS 1470 – pressurised end stainless steel.
Finish: Anodised blue (standard version).
Anodised red (dual seal version).



Ordering Information

Standard products table

Product number	Supersedes	Description
SPS2021	N/A	Mineral single point sampler
SPS2061	N/A	Aggressive single point sampler
B84784	B.84.784	Mineral or aggressive bottle assembly
B84224	B.84.224	Mineral oil extension hose/coupling
B84225	B.84.225	Aggressive oil extension hose/coupling
B84788	B.84.788	Mineral oil waste hose
B84787	B.84.787	Aggressive oil waste hose

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Notes

Inline Sensors & Monitors

System 20

System 20

Features & Benefits

Covering a wide range of flow rates, fluid types and applications, Parker's System 20 sensors are designed to be used with System 20 electronic or analogue monitors, contamination monitors and the H_2Oil. Specially developed System 20 sensors are available for use with aggressive fluids. (EPDM Seals)

- System 20 monitors, combined with the inline sensor, give the user accurate and instant readings of flow, pressure and temperature without the need to shut down the system.
- For use with all mineral oils, water and water/oil emulsions.
- **Analogue Monitor** utilises 3 Day-Glo dial gauges with a protective hinged cover.
- Calibrated up to 380 l/min with dual scale bar/psi & °C/°F. (US GPM also available)
- **EM20 Electronic Monitor** gives a full digital display.
- Automatically calibrated for all 3 sizes of sensor.
- Indicates line, differential and rising peak pressure.
- Easily scrolled from metric to US.
- 300 test memory.
- Capable of downloading saved data to datum.

Typical Applications

- Drilling equipment
- Mining
- Grinding and conveying
- Industrial hydraulics
- Mobile

Hydraulic system users need to ensure that lost production is kept to the absolute minimum. To ensure this, predictive maintenance and therefore routine condition monitoring of major components is essential.

System 20 inline sensors remain at the heart of condition and contamination monitoring. Whether you're mining the coal, building the new bypass, harvesting the crops, crossing the oceans or drilling offshore – whatever the industry, System 20 represents the premier system monitoring available today.

Specification: Sensors

Construction:
Machined steel body. Electroless nickel coating to minimum depth of 40 microns
Brass/stainless steel internal components

Flow capacities:
All suitable for use with oil, water and water/oil emulsion
Size 0 – 6-25 l/min (0.5-7US GPM)
Size 1 – 20-100 l/min (1.5-26 US GPM)
Size 2 – 80-380 l/min (5-100 US GPM)

Max. working pressure:
420 bar (6000psi)

Capability:
Reverse flow

Pressure drop:
At max. rated flow, Δp is 1.1 bar (mineral oil fluid at 30 cSt 140 SSU).

Ports:
Size 0 – G3/8
Size 1 – G3/4
Size 2 – G1 1/4
} (SAE threads also available)

Repeatability:
±1% FSD

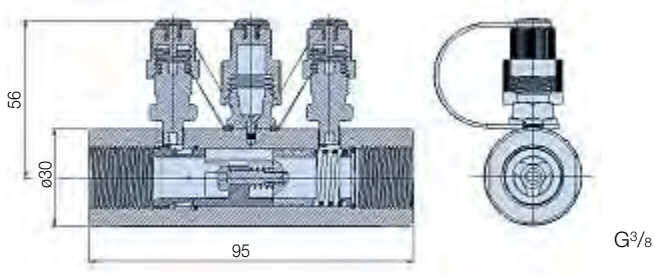
Accuracy:
Flow ±2.5% full scale deflection

Weight:
Size 0 – 0.5kg (1.2lbs)
Size 1 – 3.5kg (8.4lbs)
Size 2 – 4.4kg (9lbs)

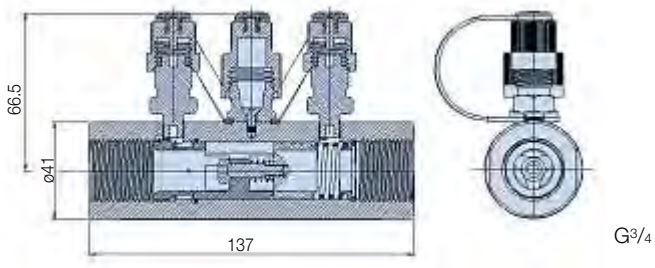
Aggressive Fluid Applications:
EPDM internal/external 'O'-rings and seals

Installation Details

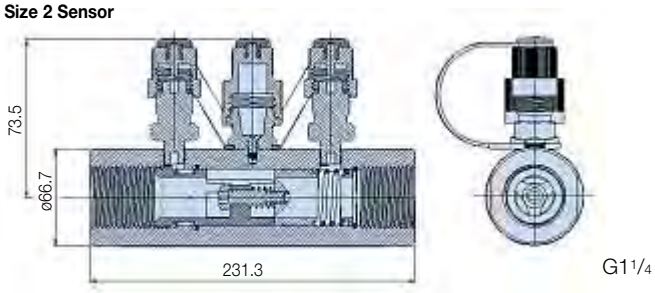
Size 0 Sensor



Size 1 Sensor



Size 2 Sensor



Ordering Information

Standard products table

Product number	Supersedes	Size	Flow range l/min	Fluid type	Port threads
STI0144100	STI.0144.100	0	6-25	Mineral	3/8
STI1144100	STI.1144.100	1	20-100	Mineral	3/4
STI2144100	STI.2144.100	2	80-380	Mineral	1 1/4
STI0148100	STI.0148.100	0	6-25	Aggressive	3/8
STI1148100	STI.1148.100	1	20-100	Aggressive	3/4
STI2148100	STI.2148.100	2	80-380	Aggressive	1 1/4

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.
Note 3: Mobile Sensors are also available - Contact Parker

System 20

A drilling equipment operation in a zinc mine has had System 20 installed for several years.

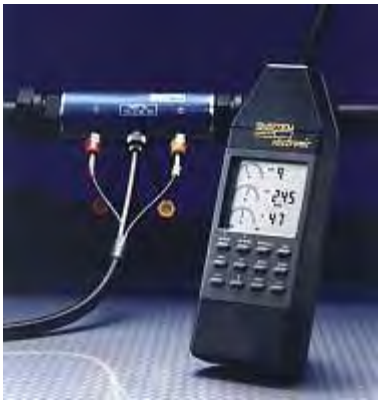
System 20 Saving £50,000 Pump Damage

Installing System 20 was part of a major restructuring plan to improve mining effectiveness and profitability. Machine operator training and oil storage operative training were essential elements of the plan. Prior to this investment, pump terminal damage could cost £10,000 for a replacement, over £1000 service costs and up to £39,000 in lost production. Add to this the difficulties of the mine's geography and it's easy to see the problems that have now been overcome.

System 20 Electronic Monitor

With System 20 inline sensors installed in a hydraulic system, faults can be predicted and remedied, all you have to do is connect the System 20 Electronic Hand Held Monitor (EM20). Designed to display flow, temperature, differential, rising peak and line pressure, System 20 Electronic can also calculate hydraulic power (kW and hp.) at a given point in a system to establish efficiency and power consumption.

System 20 electronics versatility does not end there. The EM20 is automatically calibrated for all System 20 inline sensors using water or oil and can display in l/min, US GPM, bar, psi and kg/cm2.



Battery powered and completely portable, the EM20 displays readings on the LCD and can store under a test number. Data can be downloaded via an RS232 connection to Datum. A sealed keyboard and fingertip control make the unit maintenance free and simple to use anywhere.

System 20 -The Key To Predictive Maintenance

The risk of fluid contamination by intrusive test devices is eliminated. Using System 20 Sensors and the monitor together, hydraulic fluids need never be disturbed. The monitoring procedure takes only a matter of minutes. With one System 20 monitor a user can check a complete fleet of vehicles or a factory full of hydraulic plant equipment. Predicting a problem means it can be put right as part of a planned maintenance programme. Simple routine monitoring with System 20 keeps machines running at a high level of operational efficiency.

System 20 Saving £325,000 A Day Lost Production

The mining industry puts a considerable demand on hydraulics and there are others such as agricultural machinery, harvesters or tractors and, for example, cement manufacturing plants that are equally demanding of hydraulic efficiency.

A grinding and conveying plant processes in excess of 1000 tons of ore per day in the manufacture of cement products. A days lost production costs £32,000. After one year of operation the Plant Engineers decided to invest in System 20 equipment, strategically placed to allow the Engineers to 'fault-find' the major components quickly and easily. The result is that downtime and loss of production have been reduced by 80%.

System 20 -The Proven System

For operators of industrial and mobile machinery who recognise the benefits of installing System 20 in a hydraulic system, the System 20 hand-held analogue monitor offers significant advantages, particularly in intrinsically safe applications. Like the System 20 electronic, the analogue monitor is completely portable and can be connected immediately to a purpose-designed inline System 20 sensor but requires no power source.

The analogue monitor will then - provide the user with an accurate and repeatable analysis of system flow, pressure and temperature - without having to stop the machine.

Designed as a sealed assembly requiring no routine maintenance or adjustment, analogue monitors are suitable for use with all mineral oils, water/oil emulsions and water.

The lightweight monitor has 3 dayglo dial gauges and features a protective hinged cover. The flow scale features double scale calibration - up to 100 l/min and 380 l/min and has excess flow and reverse flow indication.

Electronic Monitor Specification

Construction:
A sealed assembly requiring no routine maintenance or adjustment. Body moulding in Acrylonitrile Butadene Styrene (ABS). Key pad moulded in silicon rubber. The monitor is suitable for use with all mineral oils, water and water/oil emulsions.

LCD details

Flow section:
The analogue flow scale has reverse flow and overflow indication and provides a percentage reading of the digital full scale display automatically calibrated for all sizes of System 20 Sensor.

Pressure section:
Designed to indicate line pressure, differential pressure and rising peak pressure. Connected to a System 20 Sensor it will monitor pressure up to 420 bar (6000 psi) with an accuracy of ±1% FSD.

Temperature section:
Temperature reading between -10°C and +110°C (0°F to 230°F).

Dimensions:
The ABS Case is 291mm (11.46”) long, 105mm (4.13”) wide and 76mm (3”) deep overall.

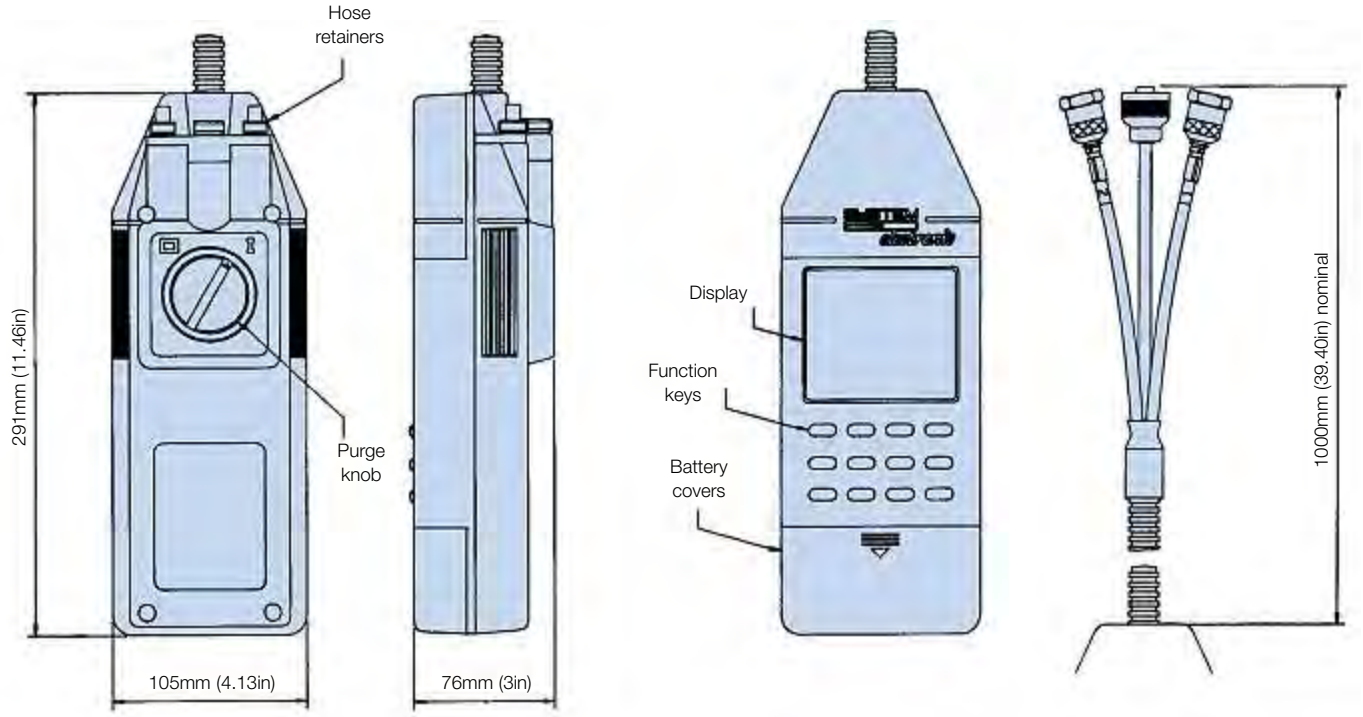
Weight:
1.4kg (3lbs).

Data logging:
Each test logs the following data:
Test number; time & date; sensor size; media tested; flow rate, pressure & temperature.

Data download:
The System 20 electronic monitor is capable of downloading saved test data to a 16 column serial printer, or a compatible PC via an RS232 connection using datum.

Batteries:
6 x AA batteries.

Re-calibration:
Annual certification by an approved Parker Service Centre.



Ordering Information

Standard products table

Product number	Supersedes	Description
EM209000	N/A	System 20 electronic monitor
B84779	B.84.779	Datum download software
P653607	N/A	Monitor and sensor carrying case
B85617	B.85.617	Dongle and cable assembly

Note 1: Part numbers featured with bold highlighted codes will ensure a ‘standard’ product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

System 20

Analogue Monitor Specification

Construction:
A sealed assembly requiring no routine maintenance or adjustment. Body moulding in Acrylonitrile Butadene Styrene (ABS). The monitor is suitable for use with all mineral oils, water and water/oil emulsions. The monitor has 3 dayglo dial gauges and features a protective hinged cover.

Gauge details

Flow section:
The flow scale has double scales for size 1 and 2 sensors only. Calibrated up to 100 l/min (26 US GPM) and 380 l/min (100 US GPM). The flow dial has excess-flow indication.

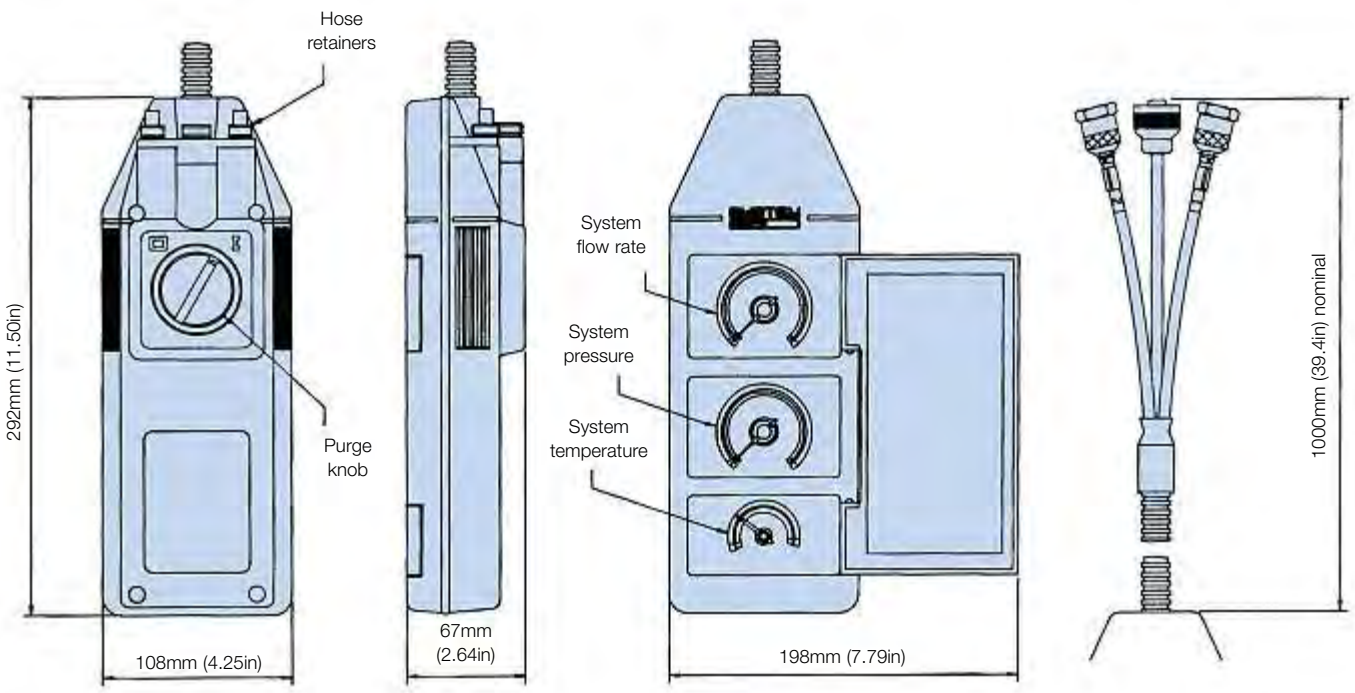
When the system is in reverse flow or when the high pressure lines to the sensor have been transposed, a 'below zero' indication is given.

Pressure section:
Dial readings in both bar and psi up to 420 bar (6000psi).

Temperature section:
The temperature dial gives readings between -10°C and +110°C (0°F to 230°F).

Dimensions:
The ABS Case is 292mm (11.5in) long, 108mm (4.25in) wide and 67mm (2.64in) deep overall.

Weight:
1.4kg (3lbs).
A viscosity chart is provided for mineral oil applications where monitoring is required at variable viscosities (cSt).



Ordering Information

Standard products table

Product number	Supersedes	Media type	Flow readings	Pressure readings	Temperature readings
STM6211110	STM.6211.110	Oil	l/min	Dual scale bar/PSI	Dual scale °C/°F
STM6611110	STM.6611.110	Oil	US GPM	Dual scale bar/PSI	Dual scale °C/°F
STM6211120	STM.6211.120	Water	l/min	Dual scale bar/PSI	Dual scale °C/°F
STM6611120	STM.6611.120	Water	US GPM	Dual scale bar/PSI	Dual scale °C/°F

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Accessories

Product number	Description
P653607	Monitor and sensor carrying case
P653106	Metal sensor protective cap

Autoremote Particle Counter

MCM20

Autoremote Particle Counter

MCM20

Features & Benefits

- The MCM20 is an online continuous particle counter ensuring constant system monitoring within defined parameters.
- PC/PLC controlled
- Ensures constant system monitoring.
- Can be pre-set to carry out tests at specific intervals.
- Can also be set up via detachable Handset.
- Enclosed in a metal casing, with internal workings on a removable chassis for ease of service and calibration.
- Connects permanently to a System 20 sensor via 2 meter hose assembly (supplied).
- Simple data formatting programme for trend analysis.
- User-friendly instrument improving familiarity and awareness of service and maintenance personnel.

Typical Applications

- Test rigs
- Construction machinery
- Industrial plant
- Hydraulic equipment & system manufacturers
- Paper processing
- Steel rolling mills
- Military equipment application

The Parker MCM20

Proven as a portable particle counter able to operate in any condition, MCM20 and its principles are available to users where continuous, permanent installed monitoring is required.

The MCM20 utilises the latest laser diode method of particle counting as per our standard LaserCM. The unit is enclosed in a metal casing with access to the hydraulic connection, DC input power, fuse holder and PC/PLC connection ports located on the front panel.

The internal workings are manufactured onto a removable chassis for ease of service and calibration.

Specification

Test cycle time:
Variable between 30 seconds and 3 minutes.

Repeat test time:
Continuous Mode or between 30 seconds and 1440 minutes (24 Hours).

Principle of operation:
Optical scanning analysis and measurement of actual particles.

Particle counts:
6 channels either ACFTD or MTD calibrated.

International codes:
ISO 7-22, NAS 0-12.

Storage temperature:
-40°C to +80°C.

Operating temperature:
+5°C to +60°C (hydraulic oil temperature).

Unit control connection:
Terminal protocol via RS 232 or optional handset.

Data retrieval:
Local PC / PLC program or by optional handset.

Calibration:
By accepted on-line methods confirmed by relevant International Standard Organisation procedures.

Re-calibration:
Annual certification by an approved Parker Service Centre.

Max. working pressure:
420 bar.

Minimum working pressure:
2 bar.

Fluid compatibility:
Mineral oil or petroleum based fluids.
Aggressive fluid version also available.

Sample requirements:
0.3 – 1.5 DP bar (differential pressure) via approved inline sampling concept.

System connection:
Via System 20 inline sensors / single point sampler

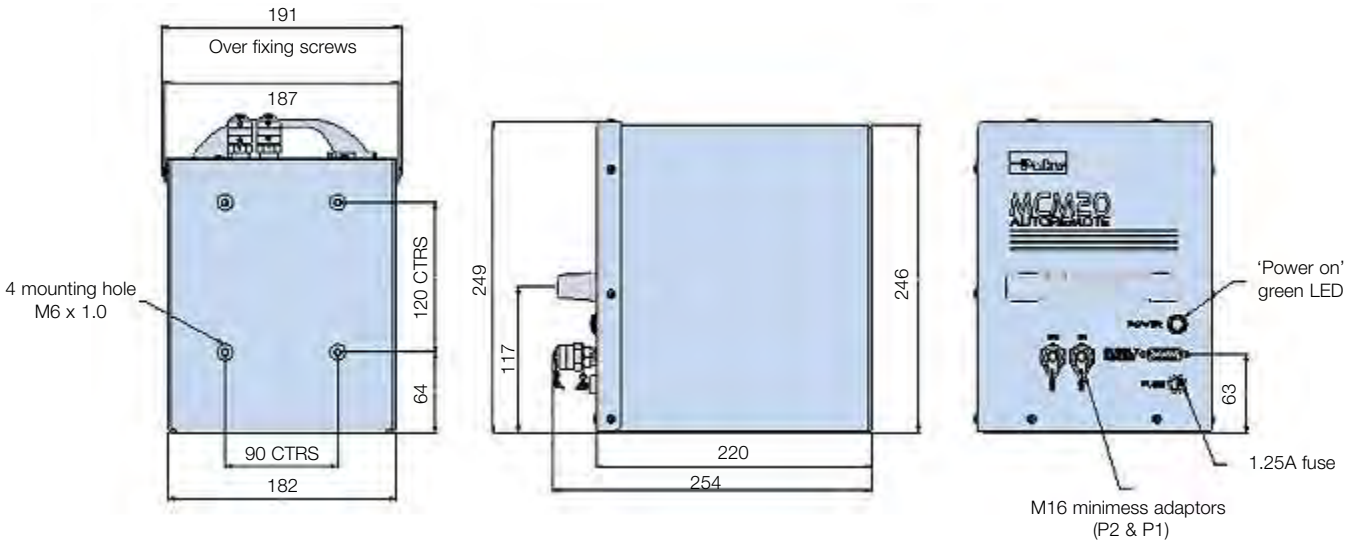
Computer compatibility:
Interface via RS 232 connection @ 9600 baud rate.

Size/weight:
249mm x 254mm x 191mm / 8.75kg.

Power requirement:
12 Vdc input. (1.25A (T) fuse). Regulated.

Installation:
Back/base M6x1.0 mounting inserts (see annotated diagrams).

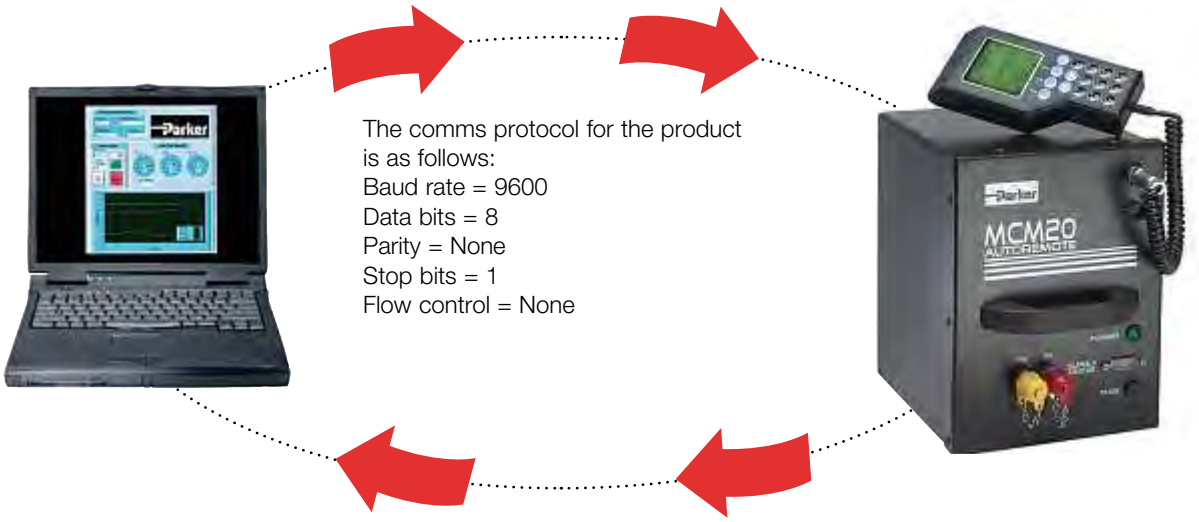
Software:
LabView demonstration software.



Autoremote Particle Counter

MCM20

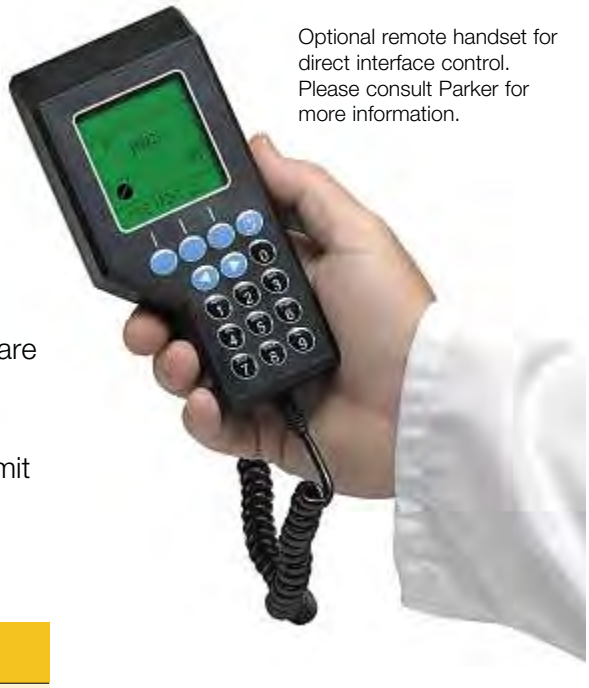
Communications Protocol



Labview

- Customised demonstration/software for MCM operation.
- Full graphic display.
- Visual indication of limit parameters.

Optional Remote Handset



Optional remote handset for direct interface control. Please consult Parker for more information.

Standard products table

Product number	Supersedes	Description
MCM202022	N/A	MTD calibrated - mineral
MCM202022HS	MCM20.2022.HS	MTD calibrated - mineral - with handset
MCM202021	N/A	ACFTD calibrated - mineral
MCM202021HS	MCM20.2021.HS	ACFTD calibrated - mineral - with handset
MCM202061	N/A	ACFTD calibrated - aggressive
MCM202062	N/A	MTD calibrated - aggressive
MCM202061HS	MCM20.2061.HS	ACFTD calibrated - aggressive - with handset
MCM202062HS	MCM20.2062.HS	MTD calibrated - aggressive - with handset
B94106	B.94.106	Handset (blue)
B94107	B.94.107	Handset (red)
B94802	B.94.802	2m mineral hose assembly
B94801	B.94.801	2m aggressive hose assembly

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Online Particle Detector

Icount PD

Online Particle Detector

IcountPD

Features & Benefits

Diagnostic Self Check Start-up Time:
5 seconds
Measurement Period:
5 to 180 seconds
Reporting interval through RS232:
0 to 3600 seconds
Digital LED display update time:
Every second
Limit Relay Output:
Changes occur +/- 1 ISO code at set limit (Hysteresis ON) or customer set (Hysteresis OFF)
4-20mA Output Signal:
Continuous
Principle of operation:
Laser diode optical detection of actual particulates.
Reporting Codes:
ISO 7 – 21, NAS 0 – 12, (AS 00 – 12 Contact Parker)
Icount will also report less than ISO 7, subject to the statistical uncertainty defined in ISO4406:1999, which is shown in the RS232, reporting results as appropriate e.g ">6"
Calibration:
By recognised on-line methods, confirmed by the relevant International Standard Organisation procedures.
Calibration Recommendation:
12 months
Performance:
+/- 1 ISO Code (Dependant on stability of flow)
Reproducibility / Repeatability:
Better than 1 ISO Code
Power Requirement:
Regulated 9 to 40Vdc
Maximum Current Draw:
150mA
Hydraulic Connection:
M16 x 2 hydraulic test points (5/8" BSF for aggressive version)

Flow Range through the device:
40 to 140 ml/min (Optimum Flow = 60ml/min)
Online Flow Range via System 20 Inline Sensors:
Size 0 = 6 to 25 l/min - (Optimum Flow = 15 l/min)
Size 1 = 24 to 100 l/min - (Optimum Flow = 70 l/min)
Size 2 = 170 to 380 l/min - (Optimum Flow = 250 l/min)
Required Differential Pressure across Inline Sensors:
0.4 bar (Minimum)
Viscosity Range:
10 to 500 cSt
Temperature:
Operating Environment -20°C to +60°C (-4°F to +140°F)
Storage -40°C to +80°C (-40°F to +176°F)
Operating Fluid 0°C to +85°C (+32°F to +185°F)
Working pressure:
2 to 420 bar (30 to 6,000 PSI)
Moisture sensor calibration:
±5% RH (over compensated temperature range of +10°C to +80°C)
Operating humidity range:
5% RH to 100% RH
Moisture sensor stability:
±0.2% RH typical at 50% RH in one year
Certification:
IP66 rated
EMC/RFI – EN61000-6-2:2001
EN61000-6-3:2001
Materials:
User friendly Abs construction.
Stainless Steel hydraulic block.
Viton seals.
Dimensions:
182mm x 155mm x 86mm (7.2" x 6.1" x 3.4")
Weight:
1.3kg (2.9lb)

- Independent monitoring of system contamination trends
- Early warning LED or digital display indicators for Low, Medium and High contamination levels.
- Moisture % RH LED indicator (optional)
- Cost effective solution in prolonging fluid life and reducing machine downtime.
- Visual indicators with power and alarm output warnings.
- Continuous performance for prolonged analysis
- Hydraulic, Phosphate Ester & Fuel fluid compatible construction
- Self diagnostic software
- Fully PC/PLC integration technology such as:
  - RS232 and 0-5 Volt, 4-20mA
  (Contact Parker for other options).

IcountPD

The Icount Particle Detector from Parker represents the most up to date technology in solid particle detection.

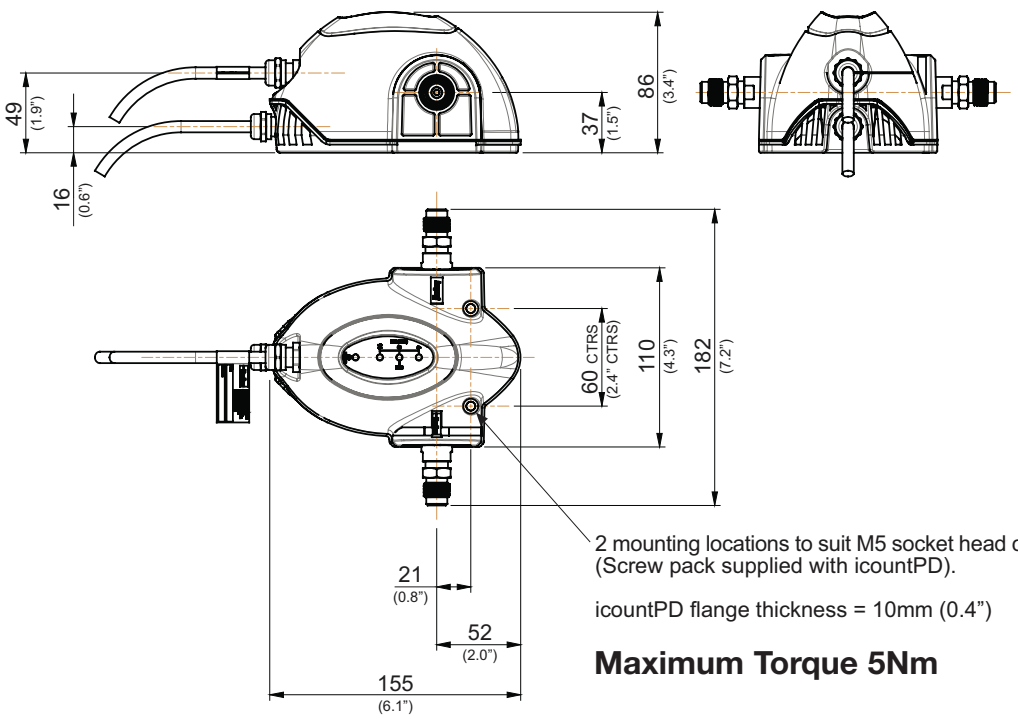
The design dynamics, attention to detail and moulding compactness of the permanently mounted, on-line particle detector module, combined with on-board, laser based, leading-edge technology, brings to all industries a truly revolutionary, particle detector as a remarkable cost effective market solution to fluid management and contamination control.

Online Particle Detector

icountPD

Dimensions / Installation Details

mm
(inches)



2 mounting locations to suit M5 socket head cap screw.
(Screw pack supplied with icountPD).

icountPD flange thickness = 10mm (0.4")

Maximum Torque 5Nm

Typical Applications

- **Mobile Equipment**
  - o Earth Moving Machinery
  - o Harvesting
  - o Forestry
  - o Agriculture

Monitoring of the hydraulics, enabling the vehicles to function to there best capability under load conditions through pistons, servo valves, control rams and gear pumps.

- **Industrial Equipment**
  - o Production Plants
  - o Fluid Transfers
  - o Pulp & Paper
  - o Refineries

To monitor the cleanliness of the equipment throughout the production line, from the machine tool controlled hydraulics through to contamination of fluid transfer. Ensuring the integrity of the fluid is maintained throughout the refining process.

- **Power Generation**
  - o Wind Turbines
  - o Gearboxes
  - o Lubrication Systems

With continuous monitoring the optimum level is achieved in the least amount of time.

- **Maintenance**
  - o Test Rigs
  - o Flushing Stands

To increase efficiency of your equipment by continuously monitoring the cleanliness level of the hydraulic fluid.

Parker Hannifin
Hydraulic Filter Division Europe
FDCB321UK.

M12 Communication cable: wiring configuration

M12 Communication cable

Pin	4-20mA option connections	0-5v/0-3v option connections
1	NOT USED	NOT USED
2	RS232 Ground (Pin 5**)	RS232 Ground (Pin 5**)
3	Channel A, ISO 4µm(c)*	Channel A, ISO 4µm(c)*
4	Channel B, ISO 6µm (c)* or NAS (if selected)	Channel B, ISO 6µm (c)* or NAS (if selected)
5	RS232 Receive (Pin 3**)	RX232 Receive (Pin3**)
6	RS232 Transmit (Pin 2**)	RS232 Transmit (Pin 2**)
7	Moisture sensor channel (if fitted)	Moisture sensor channel (if fitted)
8	Channel C, ISO 14µm (c)*	Channel C, ISO 14µm (c)*

Important Note: It is the responsibility of the end user to ensure that the cable's braided screen is terminated to a suitable earth bonding point.

* Optional – refer to the 'IcountPD part number specifier' section in this manual.

** A standard USB serial adaptor can be used with the recommended 9-way D-type connector to convert RS232 to USB.

Limit relay alarm levels

The IcountPD can be specified with a built-in limit switch relay which can be triggered when a preset alarm level is reached. The relay contacts can be used to switch on or off an external device.

M12 Supply and Relay (if fitted) cable

Pin	Current loop options connections	0-5v/0-3v option connections
1	Product supply 9-40Vdc	Product supply 9-40Vdc
2	4-20mA Supply 12-20Vdc	0-5 / 0-3V Supply 12-24Vdc
3	Relay (Normally Closed)*** (if fitted)	Relay (Normally Closed)*** (if fitted)
4	Relay (Normally Open)*** (if fitted)	Relay (Normally Open)*** (if fitted)
5	NOT USED	NOT USED
6	NOT USED	0-5V / 0-3V Supply 0 Vdc
7	Main supply 0Vdc	Product supply 0Vdc
8	Relay (Common)*** (if fitted)	Relay (Common)*** (if fitted)

Note: If the moisture sensor is fitted without either option then the output is RS232.

Parker Hannifin recommend that the mating M12 connector cables are screened. These cables are available from Parker Hannifin – ordering information section.

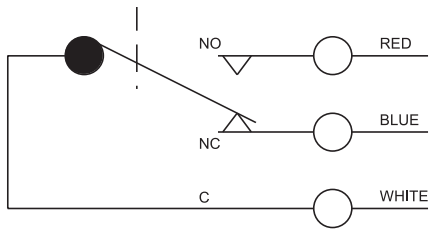
*** Optional – refer to ordering information section.

(Limit Relay Wiring Instructions)

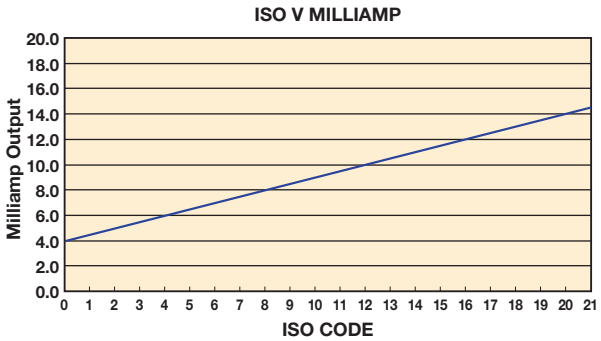
NORMALLY OPEN

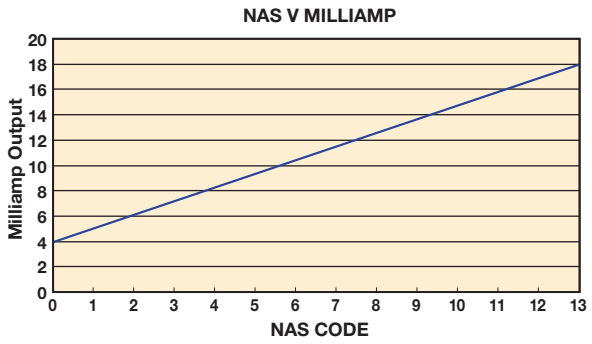
NORMALLY CLOSED

COMMON



Variable mA output settings





The following table can be used to equate the analogue output to an ISO or NAS Code.

Example ISO code 12 is equal to 10mA

mA	ISO
4.0	0
4.5	1
5.0	2
5.5	3
6.0	4
6.5	5
7.0	6
7.5	7
8.0	8
8.5	9
9.0	10
9.5	11
10.0	12
10.5	13
11.0	14
11.5	15
12.0	16
12.5	17
13.0	18
13.5	19
14.0	20
14.5	21
15.0	**
15.5	**
16.0	**
16.5	**
17.0	**
17.5	**
18.0	**
18.5	**
19.0	OVERRANGE
19.5	OVERRANGE
20.0	ERROR

mA	NAS
4	00
5	0
6	1
7	2
8	3
9	4
10	5
11	6
12	7
13	8
14	9
15	10
16	11
17	12
18	**
19	**
20	ERROR

The following table can be used to equate the analogue output to an ISO or NAS Code.

Example ISO code 12 is equal to 10mA

4-20mA output settings

ISO Setting

mA current = (ISO Code / 2) +4 eg. 10mA = (ISO 12 / 2) +4

or

ISO Code = (mA current - 4) *2 eg. ISO 12 = (10mA -4) *2

NAS Setting

mA current = NAS Code +5 eg. 15mA = NAS 10 +5

or

NAS Code = mA current -5 eg. NAS 10 = 15mA – 5

Variable voltage output settings

The variable voltage output option has the capability of two different voltage ranges: a 0–5Vdc range as standard, and a user-selectable 0–3Vdc range. The ‘Full list of commands’ on how to change the voltage output, are available from Parker.

The following tables can be used to relate the analogue ouptut to an ISO or NAS code.

For example, in a 0–5Vdc range, ISO code 16 is equal to an output of 3.5Vdc. In a 0–3Vdc range, ISO code 8 is equal to an output of 1.0Vdc.

Table relating ISO codes to Voltage output

ISO	Err	0	1	2	3	4	5	6	7	8	9	10	11	>
0–5Vdc	<0.2	0.3	0.5	0.7	0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5	
0–3Vdc	<0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	

cont.

ISO	12	13	14	15	16	17	18	19	20	21	22	Err
0–5Vdc	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	>4.8
0–3Vdc	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	>2.45

Table relating NAS codes to Voltage output

ISO	Err	00	0	1	2	3	4	5	6	7	8	9	10	11	12	Err
0–5Vdc	<0.4	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.5	>4.6
0–3Vdc	<0.2	N.S.	0.3	0.5	0.7	0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	>2.8

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Hydraulic Filter Division Europe
FDCB321UK.

Digital display parameters (ISO 4406/NAS 1638)

Start up

1. Once the IcountPD has been connected to a regulated power supply, the product logo is displayed for approximately five seconds as the IcountPD performs a self system diagnostic check.
2. The IcountPD then automatically starts monitoring using factory default test parameters.

Digital display indication

The digital display will show the actual measured codes, the channel (µ) size and the user definable limits. Note that the channel size and limits will alternate between the two.

The Moisture Sensor reading (%RH) will also be shown – if the Moisture Sensor option is fitted.

The order of trigger for both the codes and Moisture Sensor option is:

- Solid digit(s) = code(s) that are at or below the set point (limit)
- Flashing digit(s) = code(s) that are above the set point (limit)

The display for ISO4406 and NAS1638 are identical. The ISO display is shown below.

Error detection:

In the unlikely event of a error occurring, the digital display on the IcountPD will simply display the actual error code only – i.e. ERROR 13 (A full list of error codes are detailed in the IcountPD User Manual).

Moisture sensor output settings

The Moisture Sensor is an option that can be included when specifying the IcountPD.

The Moisture Sensor reports on the saturation levels of the fluid passing through the IcountPD sensing cell. The output is a linear scale, reporting within the range of 5% saturation to 100% saturation.

Table relating Saturation levels in the sensing cell to IcountPD outputs

Saturation	4–20mA	0–3Vdc	0–5Vdc
5%	4.8	0.15	0.25
25%	8	0.75	1.25
50%	12	1.50	2.50
75%	16	2.25	3.75
100%	20	3.00	5.00

Online Particle Detector

IcountPD

Auxiliary Flow Device

The pressure compensated, Flow control device (Part Number S840074) has been developed to give the IcountPD user greater flexibility. The Flow control device will enable testing where flow ranges are outside the IcountPD specifications (40 – 140 ml/min), or where pipe diameters do not allow the IcountPD to be installed.

The Flow control device fits onto the downstream (outlet) side of the IcountPD, connecting through a manifold block, via a self-sealing quick connection test point and is fitted with a differential pressure valve.

This Flow control device automatically compensates for pressure and viscosity changes, whilst maintaining its setting even as the workload changes.

Simply position the valve to match the viscosity of the oil you are testing.

The chart below can be used to determine the valve position:

Valve Position	cSt Range
3	up to 100
3.8	90 - 200
4.2	190 - 320
5	310 - 500

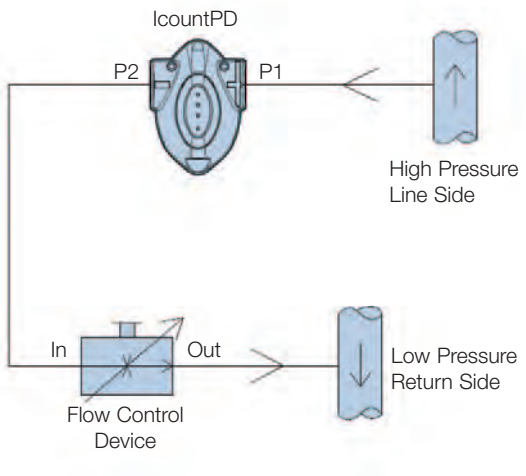
Example:

If the fluid you wish to analyse has a viscosity of 50cSt under normal operating conditions then the control knob on the Flow Control Device should be set to valve position ‘3’

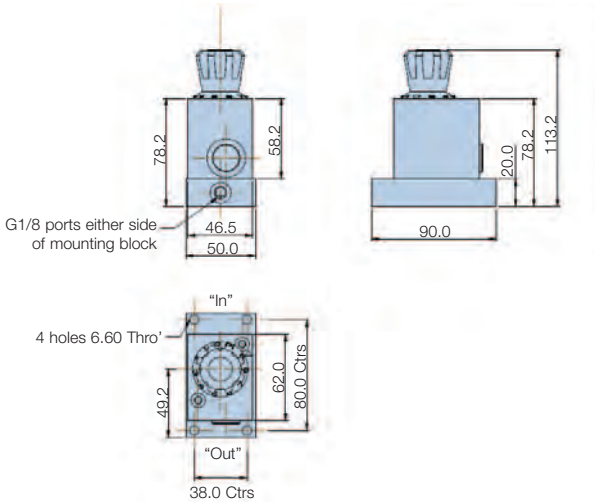
The flow device will now automatically control the flow rate through the IcountPD to within its working range of 40-140ml/min.

Note: The Flow control device will still operate correctly even with the high pressure side at 200bar and the return back to an open system of 0 bar (DP = 200bar)

Hydraulic Connection Diagram



Dimensions

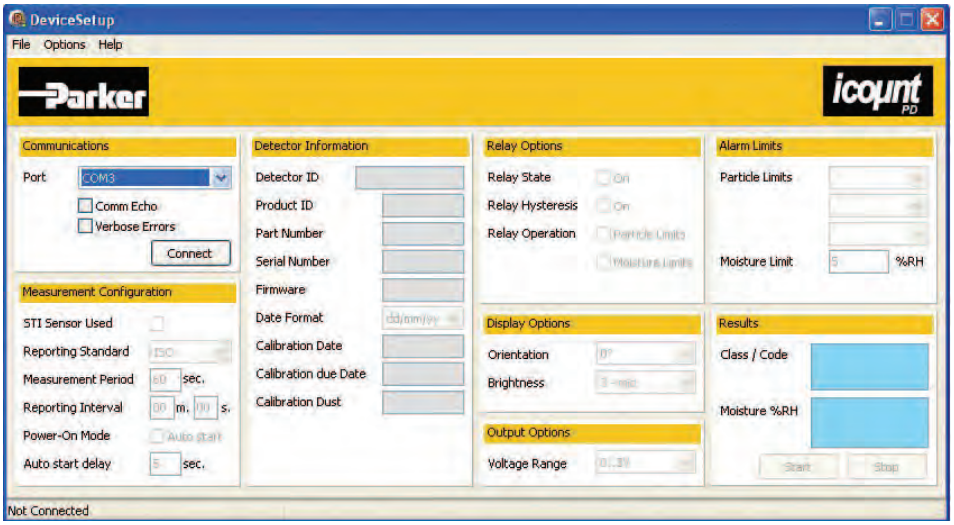


Actuator	Manual flow rate adjustable via control knob
Mounting Type	4 off mounting holes to suit M6 screws (not supplied)
Mounting position	Any
Weight	1.7kg (3.7lb)
Fluid Temperature	5°C to +80°C (+41°F to 176°F)
Ambient storage temperature	-20°C to +40°C (-4°F to +104°F)
Viscosity range	20cSt to 500cSt (If lower than 20cSt contact Parker)
Differential pressure range	5 to 315 bar
Maximum pressure	315 bar
Flow direction	'IN' to 'OUT' flow control function
Port thread detail	1/8" BSPP (test points not supplied)
Internal Seals	Viton

Communication Options

The IcountPD may be configured using the IcountPD Setup Utility. For more direct control of the device using its communications protocol, you may also use the Microsoft Windows® HyperTerminal program, but note that this program is not currently supplied with the Windows Vista™ operating system. These two ways of communicating with IcountPD are described in the following section.

IcountPD Setup Utility software



Communication Protocol

The Communication protocol for the serial communication link is to be used with **Microsoft Windows HyperTerminal**. The settings are as follows:

Baud rate	9600
Data bits	8
Parity	None
Stop bits	1
Flowcontrol	None

The commands used with this product are made up of Read, Set and Start / Stop commands.

- Set commands allow the value or values of parameters to be set
- Read commands allow the value or values or parameters to be read
- Start/Stop allows the user to start and stop tests.

Example:

[SDF dd/mm/yy] - sets the date format.

[RDF] - reads the product date format.

All commands are sent in ASCII characters, and the protocol accepts both upper and lower case characters as the examples below:

SDF

SdF

Note: A full list of commands are detailed in the user manual

Parker Hannifin
Hydraulic Filter Division Europe
FDCB321UK.

Ordering Information

Standard Products Table

Part number	Fluid type	Calibration	Display	Limit relay	Communications	Moisture sensor	Cable connector kit	Future option
IPD12212130	Mineral	MTD	LED	No	RS232 / 4-20mA	No	M12 - 8 pin	N/A
IPD12212230	Mineral	MTD	LED	No	RS232 / 4-20mA	Yes	M12 - 8 pin	N/A
IPD12222130	Mineral	MTD	LED	Yes	RS232 / 4-20mA	No	M12 - 8 pin	N/A
IPD12222230	Mineral	MTD	LED	Yes	RS232 / 4-20mA	Yes	M12 - 8 pin	N/A
IPD12312130	Mineral	MTD	Digital	No	RS232 / 4-20mA	No	M12 - 8 pin	N/A
IPD12312230	Mineral	MTD	Digital	No	RS232 / 4-20mA	Yes	M12 - 8 pin	N/A
IPD12322130	Mineral	MTD	Digital	Yes	RS232 / 4-20mA	No	M12 - 8 pin	N/A
IPD12322230	Mineral	MTD	Digital	Yes	RS232 / 4-20mA	Yes	M12 - 8 pin	N/A

Product Configurator

Key		Fluid type		Calibration		Display		Limit relay		Communications		Moisture sensor		Cable connector kit	Future option
IPD	1	**Mineral**	1	**ACFTD**	1	**None**	1	**No**	1	**RS232**	1	**No**	0	**No**	**0**
	2	**Aggressive**	2	**MTD**	2	**LED**	2	**Yes**	2	**RS232 / 4-20mA**	2	**Yes**	1	Deutsch DT Series Connector	
	3	Aviation fuel hazardous areas	3	AS4059	3	**Digital**			3	**RS232 / 0-5V**			3	**M12, 8 Pin Plug Connector***	
	4	**Aviation fuel non-hazardous area**			4	GSM			4	RS232 / RS485					
									5	RS232 / CANBUS					

Accessories

Description	Part number	
	Mineral	**Aggressive**
1 metre hose length	B84224	B84827
2 metre hose length	B94802	B94801
5 metre hose length	B84730	B84828
Minimess 1/4" BSP fitting	P653109	P843081
Minimess 1/8" BSP fitting	P653110	P853008
Minimess 1/8" NPT fitting	P653512	P853005
Single point sampler	SPS2021	SPS2061
Internal flow device	Contact Parker	Contact Parker
Power supply	B84829	
5 Metre, M12 8 Pin Plug and Socket Cable Kit*	B84654	Contact Parker
Deutsch Connector Kit	P843130	
RS232 To USB Converter	P84011	

* M12 Cable kit consists of two 5 metre cables to enable all output options (Communications cable and Relay/Power Supply cable)

Part number	Supercedes	Size	Flow range l/min	Fluid type	Port threads
STI0144100	STI.0144.100	0	6-25	Mineral	3/8
STI1144100	STI.1144.100	1	20-100	Mineral	3/4
STI2144100	STI.2144.100	2	80-380	Mineral	1 1/4
STI0148100	STI.0148.100	0	6-25	Aggressive	3/8
STI1148100	STI.1148.100	1	20-100	Aggressive	3/4
STI2148100	STI.2148.100	2	80-380	Aggressive	1 1/4

H_2Oil - Water in Oil Monitor

H_2Oil - Water in Oil Monitor

Features & Benefits

- Water monitoring is now possible while machinery is working - H_2Oil saves on production downtime.
- Totally portable, can be used easily in the field without the need for mains power, as well as in the laboratory.
- Connects into system at pressures up to 420 bar, via either system 20 sensor or single point sampler.
- 90 second test time.
- Scrolling memory for 500 tests plus memory for 20 different oil calibration curves.
- Routine water monitoring of oil systems with H_2Oil saves time and money, promoting oil longevity.
- Samples that are tested are truly representative of water in the system. Analysis carried out before sample hydrodynamics change.
- Data entry facility enables user to store unique data test log details with every test carried out.
- Instant, accurate results are available on the display or the built-in printer ensuring maintenance decisions can be taken immediately.
- Computer interface available for downloading data on to the computer through the RS232 serial port.
- Internal diagnostics features ensures H_2Oil will work accurately and reliably.
- Supplied in a robust aluminium carrying case.
- Optional oil delivery kit for simple offline sampling (see fig.1) .

Fig.1

Typical Applications

- Off-shore & power generation
- Marine
- Construction machinery
- Paper mills
- Hydraulic equipment & system manufacturers
- Research & testing institutes
- Military equipment application

The H_2Oil is a two channel non-dispersive absorption spectrometer, designed to measure the level of water content polluting the oil, reducing system efficiency, promoting wear and affecting safety.

The H_2Oil makes it possible for an end user or service engineer to carry out quick, accurate measurements, taken in the field instead of remote laboratory analysis.

With its secured hoses the H_2Oil connects to an in-line System 20 sensor or single point sampler and features a re-chargeable 12Vdc power pack, diagnostic computer and on-board printer for effective logging and retrieval of data.

Specification

Construction:
Case-Noryl structural foam and ABS printer cover. Key pad silicone rubber.

Mechanical composition:
Brass, plated steel, stainless steel.

Seals:
Fluorocarbon.

Hoses:
Nylon (Kevlar braided microbore).

Hose length:
Fluid connection hose 1.2 metre (3.9 feet).

Flow rate:
Up to 400 l/min (100 US GPM).
(System 20 Sensors). Higher flows with SPS.

Max. working pressure:
Up to 420 Bar (6000 psi).

Fluid compatibility:
Mineral oil and petroleum based fluids.

Power:
Re-chargeable battery pack (12Vdc trickle charger supplied).

Fuse:
5.0 amp fast blow fuse included for overload protection.

H2Oil technology:
Infrared absorption spectroscopy

Measurement and range:
PPM (0-3000) or % content.

Max operating temperature:
+5°C to +80°C (+41°F to +176°C).

Environmental temperature:
+5°C to +40°C (+41°F to +104°F).

Test completion time:
90 seconds.

Memory store:
500 TEST (scrolling memory) capacity.

Printer facility:
Integral 16 column thermal printer for hard copy data.
Computer interface RS232.

Repeatability/accuracy:
Better than 5% (typical).

Viscosity range:
2-100 cSt (9-460 SSU). 500cSt with SPS.

Commissioning kit:
Includes 2 re-chargeable battery packs (1 fitted to monitor), 2 x thermal printer rolls, spare fuse,screwdriver, 12Vdc trickle charger and user manual.

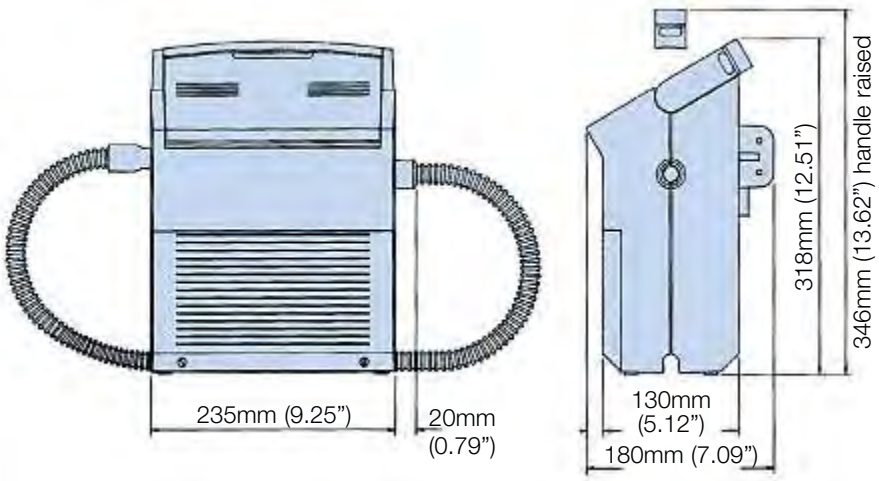
Data entry:
24 character two line back lit dot matrix LCD. Full alpha numeric keypad.

Data retrieval:
Memory access gives test search facility.

Monitor carry case:
Robust padlockable aluminium presentation case.

Datum:
Condition monitoring data software pack plus cable included in commissioning kit.

Performance recheck:
Annual recheck of performance by an approved Parker Service Centre.



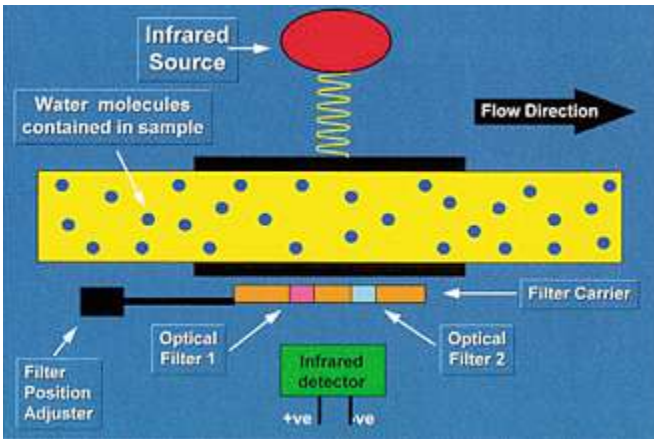
H_2Oil - Water in Oil Monitor

How the H_2Oil Works

On-line testing allows a mixed and flowing sample of oil and water to pass through the infrared measuring cell. A series of measurements can be taken and the average given as a result. With this method a representative oil sample is seen, unlike the usual reservoir samples sent for analysis. Also, by taking the test at working temperature and pressure, a true water content is taken, as both affect the way water is absorbed in oil.

The flowing sample passes through a special “water free” optical cell.

The infrared detector monitors two narrow band pass filters, one of which matches the spectral width of the water attenuation band. The second narrow wave band selected is unaffected by water and serves as a reference. By taking the transmission ratio between the two points an effective measurement of water can be made.



Core Technology

H_2Oil uses true infrared (IR) analysis technique - the principle used in all laboratory spectrometers, to measure absorbed water (before saturation point).

Channel one (2.6µ) is the reference point, whereas channel two (3µ) is H_2O.

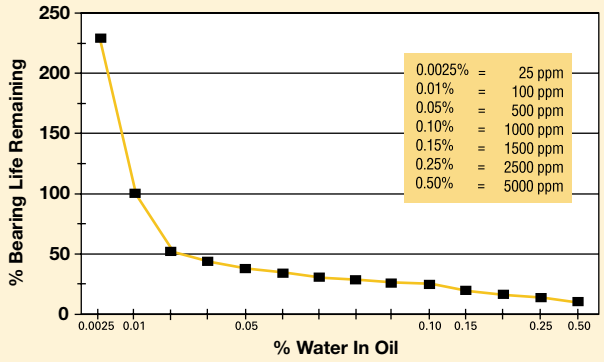
The IR source is a tungsten halogen bulb.

Effective Oil Maintenance

Take a typical application where water can have a very detrimental effect on bearings. Cracks are generated early in life of a bearing and water, once condensed in the crack, leads to corrosion and early damage.

Loss of bearing life, due to water contamination, (see below) can be prevented by stopping the water from entering the system in the first place. Introducing a regular water content monitoring function into the programme, such as the H_2Oil, would support such efforts.

Effect Of Water In Oil On Bearing Life



Effect of water in oil on bearing life (based on 100% life at .01% water in oil.)
Reference: “Machine Design” July 86, “How Dirt And Water Effect Bearing Life” by Timken Bearing Co.

Whatever the application, whether it be offshore in the oil industry or off-road in the construction or earth moving industry, the portability of the H_2Oil makes it an essential kit for the service van or engineers tool.

Ordering Information

Standard products table

Product number	Supersedes	Description
WOM9100	N/A	H_2Oil (includes aluminium case and kit)
B91701	B.91.701	Printer paper (5 rolls)
S840134	N/A	Oil delivery unit
B84779	B.84.779	Datum download software
B91706	B.91.706	Cable and adaptor

Note 1: Part numbers featured with bold highlighted codes will ensure a ‘standard’ product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Moisture Sensor Range

MS100, MS150

Cost Effective Moisture Detection

MS100 Moisture Sensor

Features & Benefits

- Continuous, online moisture indication, for hydraulic and lubricating systems.
- Reporting of % relative humidity of water content, giving the user information on how close to the fluids real saturation point.
- Reliable data on the rate of water absorption.
- Sensing cell technology using a laser trimmed thermoset polymer, for capacitive sensing that is capable of absorbing water molecules due to its micro porous structure.
- Uses a thermistor for temperature compensation correction. Offering total confidence in reporting the %RH relative humidity over the sensors temperature range.
- M12, IP68, 5 way moulded cable.
- +8 to +30 Vdc supply voltage.
- Adjustable alarm limit.
- A purpose designed tee adaptor allows for easy installation into an existing fluid system.
- The MS100 can also be specified with a bench top wand offering the end user greater flexibility.

Typical Applications

- Pulp and paper plants
- Marine hydraulics
- Power transmission & distribution
- Oil reclamation
- Industrial hydraulics
- Earth moving applications
- Agricultural

In-Line Moisture Measurement of Hydraulic & Lubricating Oils.

Parkers MS100 Moisture Sensor offers fast, reliable and accurate in-line detection of moisture in fluids. The MS100 transducer type technology has been especially designed with the preventative maintenance programme environment in mind.

The industry accepted sensing cell device will monitor and report Relative Humidity (RH), moisture content in oils. The water content measurement technique offers the end user benefits over the current standard form of water content reporting (PPM).

This allows for real time preventative maintenance to be undertaken and corrective actions to be made. By knowing that the water contamination is still within the oils absorbing range, less than 100%, reclaiming fluid properties before additive damage occurs can initiate calculable cost savings.

Specification

Pressure:
Maximum allowable operating pressure.
(MAOP): 420 bar (6000 psi).

Operating temperature:
Maximum: 85°C (185°F).
Minimum: -15°C (-5°F) – dependent on seal material.

Flow through sensor cell:
Installed in active flowstream.

Fluid compatibility:
Mineral oils and petroleum-based phosphate ester – Skydrol option available.

Viscosity range:
Unlimited.

Thread form connections:
See ordering information.

Outputs:
0 - 5 Vdc (0.85 – 4.05 Vdc dynamic range).

Maximum alarm output lead:
0.5 amps (maximum continuous lead).

Supply voltage:
8 - 30 Vdc/30mA.

Calibration accuracy:
+/- 2% RH.

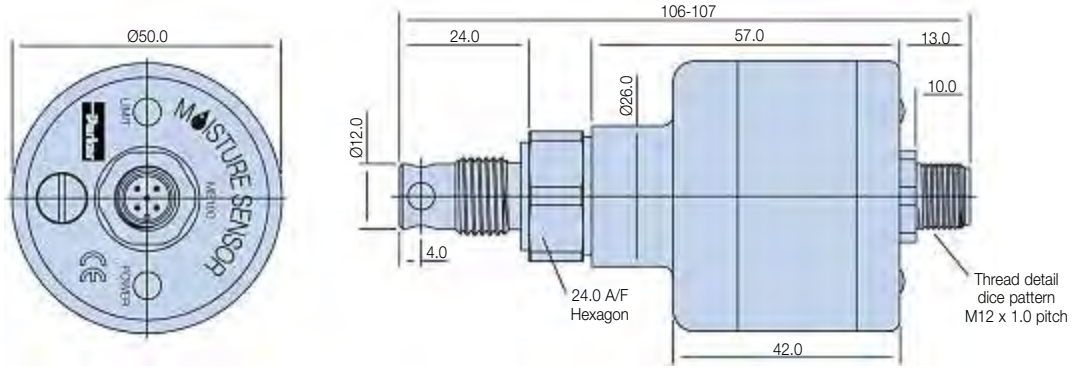
Compensated thermal stability:
+/- 1% RH (+10°C to +80°C).

Materials:
Stainless steel 316511.

Sensor size/weight:
107mm x ø50mm/0.3kg.

IP rating:
IP68 (with specified moulded cable).

Installation Details



Usage Specifications

Interpreting the data

Oil type: Texaco Rando 46.
Saturation point: 400ppm @ 65ºC (150ºF).
At the above operating condition, the meter displays 100% saturation. As the meters scale indicates a reduction in the saturation percentage, there is also a corresponding reduction in PPM at a constant temperature. In the example above, a meter reading of 50% saturation could be interpreted as 200ppm at 65ºC (150ºF).

Sensor

Using only the sensor as a go/no-go device, a red LED will indicate when the oils water concentration reaches 80% saturation and trigger a corresponding voltage output. The unit also features an analogue output proportional to % saturation with a dynamic range of 0.85 to 4.05 volts.

%RH	Under 0	0	10	20	30	40	50	60	70	80	90	100	Over 100
Vdc	<0.85	0.85	1.17	1.49	1.81	2.13	2.45	2.77	3.09	3.41	3.73	4.05	>4.05

MS100 Moisture Sensor

Visual Indicators Specifications

Bar Graph Indicator (PBG8341A)

Construction:
Housing – nylon 6/6, window – acrylic,
bezel/board supports – ABS,
pins – phosphor bronze.

Power supply:
11 – 30 Vdc.

Signal input: (By dipswitch configuration)
Off – differential up to 5V.
A – single signal (Ref. 0V) up to 5V.
B – single signal (Ref. 1V) up to 6V.

Cut out size:
45.6mm x 45.6mm.

Fixing:
Push fit panel thickness 0.9mm to 3.2mm.

Sealing:
Designed to IP50 standard.
(Front face may be silicon sealed after LED configuration).

Scale:
Supplied 0 to 100% in horizontal.
Other scales, in volume, consult Parker Hannifin.

Scaling factors:
10% to 100% range. Fully adjustable.

Lamp intensity:
4mcd each.

Front viewing:
Polarised.

Weight:
29gms.

Description	DDU1001	DDU1002
Power supply	22 - 55 Vdc	110 - 240 Vdc
Accuracy	± 0/01% typical	± 0.1% typical
Sample rate	10 per second	2.5 per second
Operating temp (°C)	0 - 55	0 - 50
Storage temp (°C)	-10 to +70	-10 to +70
Display	5 digit LED	3½ digit LED
Power output (Vdc)	24	24
Weight (kg)	0.21	0.30
Panel cutout (mm)	92x48 ±/0.5	93x45 ±/0.5
Dimensions (mm)	48x96x100	48x96x93

PBG8341A

DDU1001

DDU1002

The MS100 Moisture Sensor has a maximum cable length of 10 meters, before the output starts to degrade. The MS100 extension box boosts all the outputs from the MS100 Moisture Sensor. This enables the outputs to go another 10 meters.

Features

- IP67 rated container (120mm x 100mm x 60mm)
- Integrated 10 meter PVC cable already fitted.
- Complete with wall mounting kit.
- No additional power supply required.
- Universal box means it can be positioned in any orientation.

Ordering Information

Standard products table - moisture sensors

Product number	Supersedes	Model	Thread form	Seal option
MS1001P	MS100-1P	MS100	1/4" BSP with bonded seal	P
MS1005P	MS100-5P	MS100	9/16 - 18UNF 2A (SAE J514)	P
MS1002P	MS100-2P	MS100	1/4" BSP with integral seal	P
MS1003P	MS100-3P	MS100	R1/4" BSPT	P
MS1004P	MS100-4P	MS100	1/4" NPT	P
MS1006P	MS100-6P	MS100	Handheld version	P
MS1007P	MS100-7P	MS100	Inline tee version	P

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Standard products table - accessories/panel displays

Product Number	Supersedes	Description
P9732PVC02	P.9732PVC-02	2 meter M12 IP68 PVC coated cable
P9732PVC05	P.9732PVC-05	5 meter M12 IP68 PVC coated cable
DDU1002	DDU-1002	+110 to +240 Vac process indicator
PBG8341A	PBG.8341.A	+11 to +30 Vdc bar graph indicator
P9732PVC10	P.9732PVC-10	10 meter M12 IP68 PVC coated cable
P9732PUR02	P.9732PUR-02	2 meter M12 IP68 PUR coated cable
P9732PUR05	P.9732PUR-05	5 meter M12 IP68 PUR coated cable
P9732PUR10	P.9732PUR-10	10 meter M12 IP68 PUR coated cable
S970400	N/A	12 Vdc power supply
S970410	N/A	10 meter extension box
P973200	N/A	IP67 Re-wireable M12 connector
DDU1001	DDU-1001	+22 to +55 Vdc process indicator

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Cost Effective Moisture Detection

MS150 Moisture Sensor

Features & Benefits

- Return line low pressure rating: Up to 10 bar (145 PSI)
- Results reported as a “% saturation” of water in your oil
- Variable signal output options
  - (+1 to +5 Vdc) (+4 to +20mA) RH%
  - (0 to +5 Vdc) Temperature
- Compatible with Parker Digital Display Units (DDU1001, DDU1002 and the bar graph indicator PBG8341A)
- Simple dynamic installation into a flow path
- Temperature compensated results
- Two thread forms (1/4” BSPT & 1/4” NPT)
- Easier and more flexible cable connection
- Independent temperature output
- 2 alarm point option with alarm module (PAM8342)

Parkers MS150 Moisture Sensor is the easy-to-fit, lightweight and cost-effective solution to accurately measure the % moisture present in operating fluids.

MS150 provides an effective early warning device when connected to an array of monitoring options to ensure continuous system protection and fluid integrity.

Typical Applications

- Earth moving machinery
- Forestry
- Agricultural (harvestors, tractors)
- Industrial factory (pulp & paper processes)
- Marine (hydraulic stabilizer systems)
- Test rig stands (critical test machines)
- Ground support vehicles (military)
- Fluid transfer systems (skids)
- Commercial aerospace and ground support systems (skids)

Detect water contamination before it shuts your application down

Dynamic moisture monitoring for todays demanding mobile hydraulic systems. The new lightweight MS150 moisture sensor is designed to produce accurate, **real time** moisture indications in petroleum - based, synthetic oils and phosphate ester (aggressive fluids) below fluid saturation levels.

Specification

Pressure:
Maximum allowable operating pressure. (MAOP): 10 bar (145 PSI).

Operating temperature:
Minimum: -20°C (-4°F).
Maximum: +85°C (+185°F).

Flow through sensor cell:
Installed in active flowstream.

Fluid compatibility:
Mineral oils, petroleum-based and Phosphate ester.

Viscosity range:
Unlimited.

Port connections:
1/4" BSPT or 1/4" NPT.

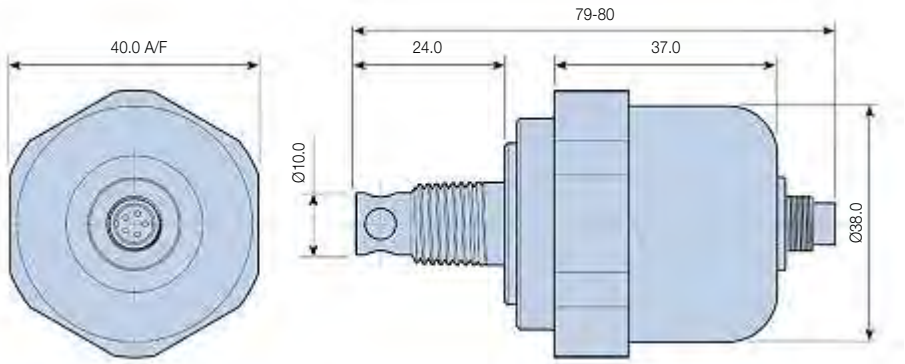
Outputs:
Variable - see sensor outputs.

Supply voltage:
+8 to +30 Vdc.

Sensor size/weight/material:
80mm x 43mm/0.1kg/Aluminium

IP ratings:
IP54

Installation Details



All dimensions in millimetres (mm)

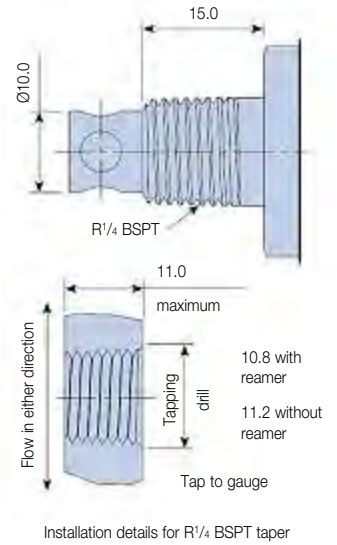
Dimensions are for reference only

MS150

Water enters hydraulic and lubricating systems from a variety of sources. Atmospheric ingression of water vapor, as well as internal heat exchanger leaks, create unfavorable operating conditions. The MS150 Moisture Sensor eliminates the guesswork by providing real time condition monitoring. It is designed to work well in petroleum/synthetic hydraulic and lubricating oil applications.

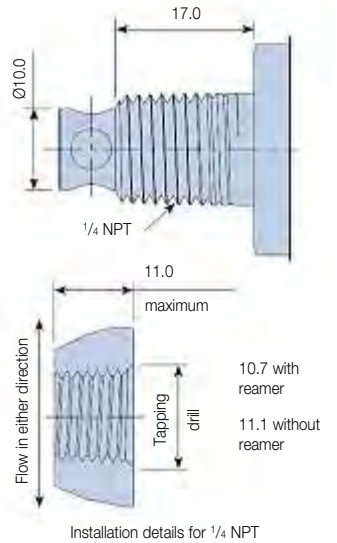
Thread Form Options

BSPT



Installation details for R1/4 BSPT taper

NPT



Installation details for 1/4 NPT

For alternative thread forms please contact Parker Filtration

Cost Effective Moisture Detection

MS150 Moisture Sensor

Interpreting Data

The Parker MS150 Moisture Sensor is designed to provide real time accurate and repeatable results reported as % saturation of water. Percent saturation is a useful measurement that offers the user a simple, quantitative method in determining how wet or dry a hydraulic or lubricating system may be. In contrast, PPM and % water by volume measurements provide little information about a fluid's free or dissolved water condition. % saturation can now easily be converted to PPM as long as the fluid's saturation point is known using the MS150 temp output.

Example
Oil type: Texaco Rando 46
Saturation point: 400ppm @ +65°C (+150°F)

At the above operating condition, the meter displays 100% saturation. As the meter's scale indicates a reduction in the saturation percentage, there is also a corresponding reduction in PPM at a constant temperature. In the example above, a meter reading of 50% saturation could be interpreted as 200ppm at +65°C (+150°F)

Sensor Outputs

MS150 moisture sensor pin designations			
Pin	**Designation**	**I/O**	**Description**
1	Supply	Input	Supply voltage (+8 to +30Vdc)
2	%RH	Output	% Saturation out (+1 to +5Vdc)
3	%RH	Output	% Saturation out (+4 to +20mA)
4	Temperature	Output	Temperature out (0 to +5Vdc)
5	Common	Input	Common (0Vdc) ground from power supply (not chassis ground)

Indicator Options

For specifications on the process indicator options see page 268 and 269 for ordering information.

DDU1001

DDU1002

Description	DDU1001	DDU1002
Power supply	22 - 55 Vdc	110 - 240 Vdc
Accuracy	± 0/01% typical	± 0.1% typical
Sample rate	10 per second	2.5 per second
Operating temp (°C)	0 - 55	0 - 50
Storage temp (°C)	-10 to +70	-10 to +70
Display	5 digit LED	3½ digit LED
Power output (Vdc)	24	24
Weight (kg)	0.21	0.30
Panel cutout (mm)	92x48 ±/0.5	93x45 ±/0.5
Dimensions (mm)	48x96x100	48x96x93

Ordering Information

Standard products table

Product number	Supersedes	Description
MS1503	MS150-3	¼" BSPT moisture sensor
DDU1002	DDU-1002	+110 to +240 Vac process indicator
MS1504	MS150-4	¼" NPT moisture sensor
DDU1001	DDU-1001	+22 to +55 Vdc process indicator
PBG8341A	PBG.8341.A	Bar graph indicator
PAM8342	PAM.8342	Alarm module

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Hand-held Oil Condition Monitor

Oilcheck

Hand-held Oil Condition Monitor

Oilcheck

Features & Benefits

- A comparator between new and used oils.
- Oilcheck gives early warning of impending engine failure.
- Cost effective solution to save money and help increase engine life.
- Completely portable, battery powered.
- Ideal for fleet owners, garages and DIY mechanics.
- Numerical display to show positive or negative increase in dielectrics.

Using Oilcheck

Following the simple sampling procedure. The Oilcheck will ensure effective and highly repeatable results. Once a clean oil sample has been placed in the 'Sensor Well' and the 'TEST' button has been pressed, the instrument will 'zero' on the sample.

Once cleaned out with a degreaser and replaced by a contaminated sample, a new reading is obtained on the LCD, which can be easily compared against the green/amber/red efficiency scale.

Typical Applications

- Fleet owners
- Construction equipment maintenance
- Vehicle service garages
- Plant hire maintenance

The Oilcheck from Parker Filtration's Condition Monitoring Centre detects and measures the dielectric constant of oil, by comparing the measurements obtained from used and unused oils of the same brand.

Used as a regular service monitoring instrument, the Oilcheck will give the engineer warning of an impending engine failure and promote increased engine life. Oilcheck is the low-cost solution that will take the guesswork out of oil changes, saving money and time.

Specification

Case construction:
ABS.

Circuitry:
Microprocessor control.

Battery:
1 x 9V alkaline.

Display:
LCD.

Suitable oil types:
Mineral and synthetic based oils.

Repeatability:
Better than 5%.

Readout:
Green/amber/red grading, Numerical value (0-100).

Battery lifetime:
>150 hours or 3,000 tests.

Dimensions:
250mm x 95mm x 34mm (9.8” x 3.7” x 1.3”).

Weight:
0.4kg.

Using Oilcheck

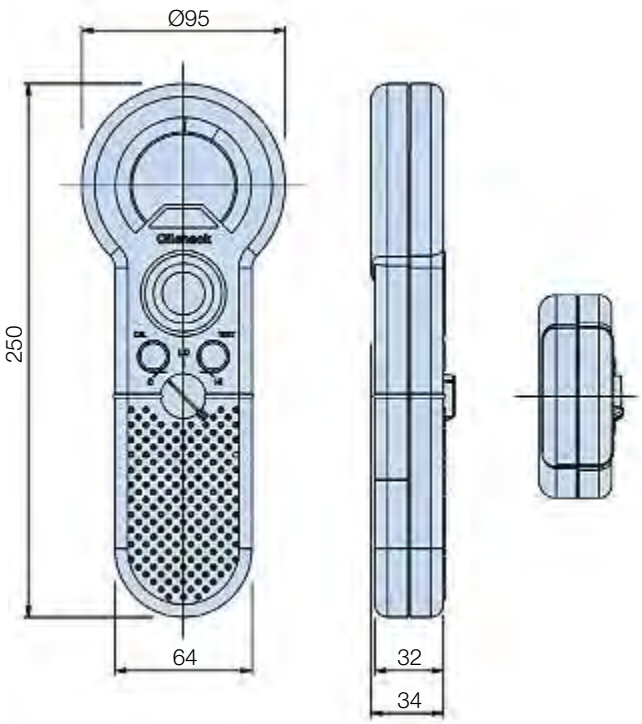
Green/amber/red numerical value

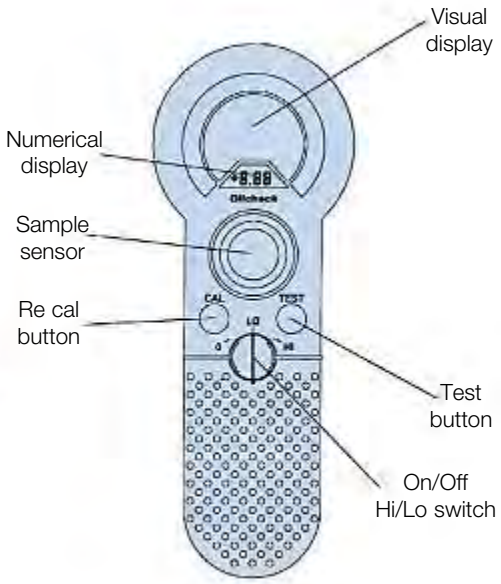
Function buttons

The Oilcheck can remove the need for costly and time consuming laboratory analysis of mineral and synthetic oils used in engines, gearboxes and bearing lubrication systems. It detects mechanical wear and any loss of lubricating properties in the oil with a repeat accuracy of less than 5%.

The Oilcheck is able to show changes in the oil condition brought about by the ingress of water content, fuel contamination, metallic content and oxidation.

Installation Details





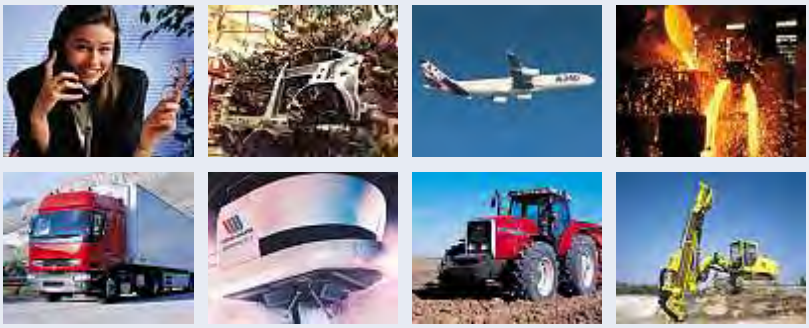
Ordering Information

Standard products table

Product number	Description
OLK605	Oilcheck kit with numerical readout
OLK611	Oilcheck cleaner

Note 1: Part numbers featured with bold highlighted codes will ensure a ‘standard’ product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

With Parker as your partner, you have access to the world's broadest line of motion control components and systems



Parker is the only company in the World to manufacture and supply a complete range of hydraulic, pneumatic and electromechanical systems and components. Whether your need is for cylinders, valves, pumps, filters, drives, controls, connectors or seals, Parker has a product to meet your needs from a range of more than 600,000 for every type of mobile and industrial application.

For further information call our Product Information Centre free on 00800 27 27 5374 or visit our web site at www.parker.com

00800 27 27 5374
www.parker.com
epic@parker.com

Laboratory Analysis Service

Par-Test™

Laboratory Analysis Service

Par-Test™

Changes to ISO Standards

The impact on filter performance reporting and the contamination code.

The recent changes to ISO contamination and filtration standards were brought about to solve accuracy, tracability, and availability issues. It is important to remember that both real world hydraulic system cleanliness levels and actual system filter performance remain unchanged.

However, the reporting of cleanliness levels and filter performance has changed due to the new particle counter calibration and multi-pass test procedures.

The new calibration method.

ISO 11171 is the new particle counter calibration method and utilises calibration fluid made from ISO Medium Test Dust (ISO MTD) suspended in MIL-H-5606. The calibration fluid is traceable to the National Institute of Standards and Technology (NIST) and is designated by NIST as Standard Reference Material (SRM) 2806. ISO 11171 is replacing ISO 4402 which is based on obsolete AC Fine Test Dust (ACFTD)

It is important to note that the ISO 11171 calibration method is based on a distribution of particles measured by their equivalent area diameter, whereas ISO 4402 is based on distribution of particles measured by their longest chord. Also, the NIST work utilised scanning electron microscopy for particles below 10µm in size, whereas sizing distribution on ACFTD utilised optical microscopy.

The charts to the right show the approximate particle size relationship between the calibration methods.

Chart 1 - ISO Comparison

Former two-digit ISO 4406:1987 5µm / 15µm 14 / 11
Former three-digit ISO 4406:1987 2µm / 5µm / 15µm 17 / 14 / 11
New three-digit ISO 4406:1999 4µm (c) / 6µm (c) / 14µm (c) 18 / 14 / 11

Chart 2 - Particle Size Comparison

ACTFD size (per ISO 4402:1991) µm	NIST size (per ISO 11171:1999) µm (c)
1	4.2
2	4.6
3	5.1
5	6.4
7	7.7
10	9.8
15	13.6
20	17.5
25	21.2
30	24.9
40	31.7

Laboratory Analysis Service

The Par-Test service is a complete laboratory analysis performed on a small quantity of fluid supplied by the customer.

Provision of a sampling bottle of known cleanliness and a pre-addressed bottle container, both of which are designed to be suitable for mailing, is part of the service.

Most contaminant in hydraulic or lube oil systems are invisible

Damage causing particles range from 5 to 40 micrometers in size, but the limit of human visibility is only 40 micrometers. Harmful particulate matter is often invisible, even in very high concentration. Also, acids, water and other fluid oxidation by-products cannot be easily detected by human senses. Some other means must be used to monitor fluid conditions.

Fluid analysis is the only method to check fluid conditions

Fluid analysis services may be as simple as a sample batch comparison. Or, a full laboratory treatment may be used to indicate the sources and quantity of contamination. In either case, important test results are achieved. Parker offers both types of services to fit your specific needs.

Par-Test: complete laboratory analysis

Par-Test is a complete laboratory analysis, performed on a small quantity of fluid. The test results are very comprehensive, and can include the following critical analysis:

- Spectrochemical analysis of over 20 wear metals and additives.
- Particle count reported over five size ranges. The particle count is expressed as an ISO cleanliness code. It is also plotted on a graph for better comparisons.
- Viscosity at 40°C, 100°C, Viscosity Index and TAN are reported.
- Water content is expressed as a % of volume. Many hydraulic systems may tolerate up to 300 ppm (.03%) of water contamination. Some bearing or lube oil systems must strictly limit water content.
- Analysis recommendations summarises Par-Test results and indicates what action should be taken to prevent any potential problems.
- Fast turnaround—test results are mailed back to you within 24-48 hours after receiving your fluid sample. Tests including Spectro-chemical analysis allow 7 days.

Par-Test: concise and complete

The Par-Test report you receive is neatly organised. You may quickly analyse the test results — or compare them to a previous sample. Using the same “unit number” on your sample information form will allow up to four test results listed on a single Par-Test report form. Par-Test belongs in your regular maintenance program. Comprehensive and accurate fluid analysis will help you prevent major hydraulic or lube oil system problems. Order Par-Test today (see below details) and see how easy and complete—fluid analysis can be.

Ordering Information

Par-Test: laboratory fluid analysis

The purchase price for the Par-Test sample kit includes the pre-cleaned and sealed sample bottle, mailing tube with a pre-addressed label, sample information data sheet to be completely filled out by the end user and the complete laboratory analysis.

IMPORTANT
Parker Filtration has three European laboratory locations able to receive and process fluid samples. One location in the UK, one location in The Netherlands taking care of Central European analysis and a location in Finland to provide Scandinavian analysis. Decide on the Option required and contact the relevant Parker location.

Par-Test laboratory analysis service	- UK (Email: filtrationinfo@parker.com) (option 2 only) - Holland (Email: filtration.netherlands@parker.com) (all options) - Finland (Email: filtration.finland@parker.com) **(option 2 only)**

Option	Description
Option 1	Sample bottle plus particle/membrane/water/microscopic photo analysis **(Holland only)**
Option 2	Sample bottle plus particle/water/spectro-chemical analysis **(Finland and UK only)**
Option 3	Sample bottle plus membrane/water/microscopic photo analysis **(Holland only)**
Option 4	Sample bottle plus particle/membrane/water/spectro-chemical/microscopic photo analysis **(Holland only)**

Note: Please allow 24-48 hours of laboratory time plus mailing/shipping time to receive your test results.

Laboratory Analysis Service

Par-Test™ Charts

PAR :TEST Fluid Analysis

PARKER NO.	CLIENT NO.	UNIT NO.
1000.	27	4714

OTHER 295

LOCATION **RETURN**

FILTER MANUF **PARKER**

PUMP MODEL **LINE TRUCK**

MICRON RATING **10NOM**

FLUID MANUF

FLUID TYPE

NUMBER COPIES 2

TYPE NUMBER 2

SAMPLE DATA

SPECTROCHEMICAL ANALYSIS VALUES REPORTED IN PARTS PER MILLION (PPM) BY WEIGHT

LAB#	DATE TAKEN/ TESTEN	DATE FILTER SERVICE	IRON	CHROMIUM	LEAD	COPPER	TIN	ALUMINIUM	NICKEL	SILVER	MANGANESE	SILICON	BORON	SODIUM	MAGNESIUM	CALCIUM	BARIUM	PHOSPHORUS	ZINC	MOLYBOENUM	TITANIUM	VANADIUM	CADMIUM	VIS 40°C (VIS 104 °F)	VIS 100°C (VIS 212 °F)	WATER
9261	30JUN89		3	0	0	2	0	0	0	0	0	9	0	0	2	29	291	339	233	0	0	0	0	32.7	N/A	0
	02JUL89																									
9262	28JUL89		2	0	0	2	0	0	0	0	0	9	0	0	4	24	25	156	244	0	0	0	0	32.8	N/A	0
	30JUL89																									
9263	20AUG89		1	1	0	1	0	0	0	0	0	7	0	0	1	29	24	133	207	0	0	0	0	32.3	N/A	0
	22AUG89																									

PHYSICAL PROPERTY DATA

LAB#	ANALYSIS RECOMMENDATIONS ISO	RATING
9261	20/	17
9262	19/	14
9263	16/	12

PARTICLES PER 100 MILLILITER GREATER THAN INDICATED SIZE

>5	>15	>25	>50	>100
667,488	67,608	15,440	872	88
315,466	12,052	2,496	296	8
41,758	2,280	664	112	16

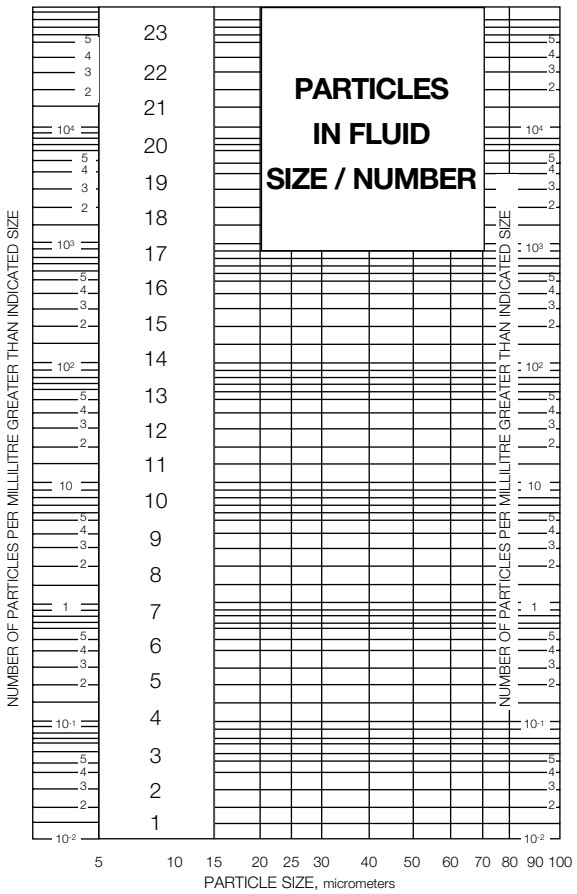
LAB# ANALYSIS RECOMMENDATIONS

9261 EXTREME LEVELS OF CONTAMINATION INDICATE POSSIBLE WEAR PROBLEMS. HIGHER PRESSURE SYSTEMS(.1500 PSI) SHOULD RECEIVE IMMEDIATE FILTRATION ATTENTION. SAMPLE AGAIN WITHIN 30 DAYS

9262 EXTREME LEVEL OF CONTAMINATION INDICATE POSSIBLE WEAR PROBLEMS. HIGHER PRESSURE SYSTEMS (>1500 PSI) SHOULD RECEIVE IMMEDIATE FILTRATION ATTENTION. SAMPLE AGAIN WITHIN 30 DAYS

9263 CLEANLINESS LEVEL SUITABLE FOR MOST SYSTEMS. SERVO CONTROLS REQUIRE CLEANER FLUID. CONTINUE REGULAR PREVENTIVE MAINTENANCE. SAMPLE AGAIN IN 2 - 3 MONTHS.

Since remedial advice is based on test results provided by others, and since corrective action, if any is performed by others, remedial advice is rendered without warranty or liability of any kind.


PARTICLES IN FLUID SIZE / NUMBER
NUMBER OF PARTICLES PER MILLILITRE GREATER THAN INDICATED SIZE
PARTICLE SIZE, micrometers
5 10 15 20 25 30 40 50 60 70 80 90 100
23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Viscosity Conversion Chart

cSt (centistrokes)	SUS (Saybolt Universal Seconds)
10	46
20	93
25	116
30	139
32.4	150
40	185
50	232
70	324
90	417

Comparisons are made at 100ºF (38ºC).
for other Viscosity Conversion Approximations, use the formula: $cSt = \frac{SUS}{4.635}$

Cleanliness Level Correlation Table

ISO Code	Particles/Millilitre ≥ 5 Micrometers	≥ 15 Micrometers	ACFTD Gravimetric Level, mg/L	NAS 1638 (1964)	Disavowed "SAE" Level (1963)
26/23	640,000	80,000	1000		
25/23	320,000	80,000			
23/20	80,000	10,000	100		
21/18	20,000	2,500		12	
20/18	10,000	2,500			
20/17	10,000	1,300		11	
20/16	10,000	640	10		
19/16	5,000	640	10		
18/15	2,500	320		9	6
17/14	1,300	160		8	5
16/13	640	80	1	7	4
15/12	320	40		6	3
14/12	160	20		5	2
14/11	160	20		5	2
13/10	80	10	0.1	4	1
12/9	40	5		3	0
11/8	20	2.5		2	
10/8	10	2.5			
10/7	10	1.3		1	
10/6	10	.64	0.01		

For more information: Contact Parker Filtration's Condition Monitoring Centre: Tel: +44 (0) 1842 763299.
Fax: +44 (0) 1842 756300. Email: conmoninfo@parker.com

Pressure Transducers and Transmitters

ASIC 'Performer'

25, 60, 100, 250, 400 and 600 bar

Pressure Transducers and Transmitters

ASIC 'Performer'

Applications for the ASIC Performer

- Fork lift trucks - braking and load systems.
- Truck mounted cranes - load safety systems.
- Earth moving machinery - hydraulic gearbox control.
- Racing car - gearbox, fuel, cooling and suspension systems.
- Water usage systems - pressurised systems for industrial and hi-rise usage.
- Forest Machinery - felling and logging.
- Paper mills - speed control and weighing systems.

The Parker Filtration ASIC Performer Pressure Transducers and Transmitters.

The ASIC Performer offers a wide range of pressure sensors for mobile or industrial applications.

These sensors have been designed for the requirements of industrial instrumentation systems. Accordingly, the housings and all components in contact with the medium are made of stainless steel. Thus giving compatibility with a wide range of media. There is a choice of two plug connectors of either DIN or M12. There are six measuring ranges available and a choice of outputs in the form of either voltage or current signals. Sensors with output signals from 4...20 mA are available in two wire technology.

The built-in voltage regulator allows the sensors to be operated with a supply voltage of 12-36/9-36 Vdc. All sensors are manufactured in our own production facility, typical of Parker Hannifin's continued commitment to flexibility and quality.

The Complete Performer range utilises ASIC technology (Application Specific Integrated Circuit) programmable software.

AC/DC display unit (DDU1002)

A comprehensive range of Pressure Transducers and Transmitters are available from Parker Filtration.

- One-piece body and diaphragm machining ensures long-term product stability.
- All stainless steel construction.
- 6 transducer pressure ratings with 0-5Vdc and 1-6Vdc outputs.
- 6 transmitter pressure ratings with a 2-wire 4-20mA output.
- Microdin din plug and M12 connector options.

Specification

Pressure ranges:
25, 60, 100, 250, 400, 600 bar.

Pressure Tolerance Specifications:

Rating	Maximum Overload Pressure	Maximum Burst Pressure
25	x 6.0 (150 bar)	x 20.0 (500 Bar)
60	x 2.5 (150 Bar)	x 8.0 (500 Bar)
100	x 2.5 (250 bar)	x 5.0 (500 Bar)
250	x 4.0 (1000 Bar)	x 7.0 (1800 Bar)
400	x 2.5 (1000 Bar)	x 4.5 (1800 Bar)
600	x 1.5 (1000 Bar)	x 3.0 (1800 Bar)

Vibration resistance:
IEC 60068-2-6:
+/- 5mm/10Hz...32Hz
200m/s^2 / 32Hz...2kHz

Installation:
Spanner size 22A/F.
Max. (recommended) tightening torque = 30Nm.

Weight:
200 - 230g

Lifespan:
10 million cycles

Thread Forms

G1/4 (1/4BSP) with ED seal.

All thread forms and sensor interface are made from 1.4301 stainless steel.

Non standard threads - contact Parker CMC

Electrical

Supply voltage	Output
12 - 36Vdc	0 - 5Vdc
12 - 36Vdc	1 - 6Vdc
9 - 36Vdc	4 - 20mA

Transducer current draw = <6mA
Load impedance (ohm) = >10K
Output signal noise = 0.1%FS

Product Performance

Linearity:
Typical: 0.3%FS.
Max: 0.6%FS.

Hysteresis:
Typical: 0.1%FS.
Max: 0.25%FS.

Repeatability:
Typical: 0.2%FS.
Max: 0.4%FS.

Functional temp range:
-40°C to +85°C.

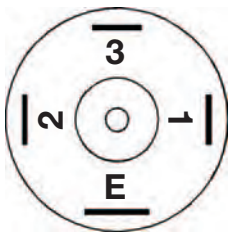
Compensated temperature:
-20°C to +85°C.

Stability:
<0.1%FS/a (typ).

Response time:
= <1mS.

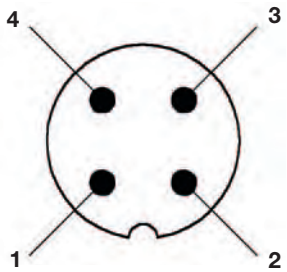
Wiring Information

Connector Industrial Micro Din 9.4mm



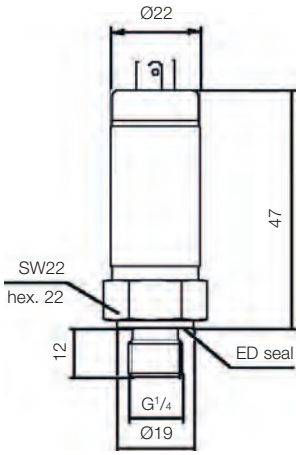
PIN	4 - 20mA	0 - 5Vdc	1 - 6Vdc
1	Do not connect	Signal output	Signal output
2	Supply +ve	Supply +ve	Supply +ve
3	Do not connect	Do not connect	Do not connect
E	Return	Supply ref. (0v)	Supply ref. (0v)

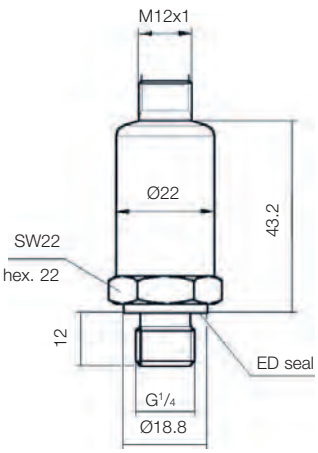
Connector M12



PIN	4 - 20mA	0 - 5Vdc	1 - 6Vdc
1	Supply +ve	Supply +ve	Supply +ve
2	Do not connect	Signal output	Signal output
3	Return	Supply ref. (0v)	Supply ref. (0v)
4	Do not connect	Do not connect	Do not connect

Installation Details





ASIC 'Performer'

Ordering Information

Standard products table

Product number	Description - pressure transducer	Model	Output	Pressure	Thread form	Connector
PTDVB2501B1C1	0 - 5 Vdc 250 bar 1/4 BSP ED seal micro-din	PTD	VB	250	1	B1C1
PTDVB4001B1C1	0 - 5 Vdc 400 bar 1/4 BSP ED seal micro-din	PTD	VB	400	1	B1C1
PTDVB2501B1C2	0 - 5 Vdc 250 bar 1/4 BSP ED seal M12	PTD	VB	250	1	B1C2
PTDVB4001B1C2	0 - 5 Vdc 400 bar 1/4 BSP ED seal M12	PTD	VB	400	1	B1C2
PTDVB0251B1C1	0 - 5 Vdc 25 bar 1/4 BSP ED seal micro-din	PTD	VB	025	1	B1C1
PTDVB0251B1C2	0 - 5 Vdc 25 bar 1/4 BSP ED seal M12	PTD	VB	025	1	B1C2

Product number	Description - pressure transmitter	Model	Output	Pressure	Thread form	Connector
PTXB4001B1C2	4 - 20 mA 400 bar 1/4 BSP ED seal M12	PTX	B	400	1	B1C2
PTXB0251B1C1	4 - 20 mA 25 bar 1/4 BSP ED seal micro-din	PTX	B	025	1	B1C1
PTXB0251B1C2	4 - 20 mA 25 bar 1/4 BSP ED seal M12	PTX	B	025	1	B1C2
PTXB4001B1C1	4 - 20 mA 400 bar 1/4 BSP ED seal micro-din	PTX	B	400	1	B1C1
PTXB2501B1C1	4 - 20 mA 250 bar 1/4 BSP ED seal micro-din	PTX	B	250	1	B1C1
PTXB2501B1C2	4 - 20 mA 250 bar 1/4 BSP ED seal M12	PTX	B	250	1	B1C2

Accessories

Product number	Supercedes	Description
P833PVC2M	P.833PVC-2M	2 meter PVC coated 4 core cable
P833PVC5M	P.833PVC-5M	5 meter PVC coated 4 core cable
P833PVC10M	P.833PVC-10M	10 meter PVC coated 4 core cable

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Product configurator

Product number	Output options		Pressure range (bar)		Thread form		Connector	
PTD	**VB**	0 - 5 Vdc	**025**	0 - 25	**1**	1/4 BSP with ED seal	**B1C1**	Micro-din
PTX	SB	1 - 6 Vdc	060	0 - 60			**B1C2**	M12
	B	4 - 20mA (PTX only)	100	0 - 100				
	RB	0.5 - 4.5 ratiometric	**250**	0 - 250				
	PB	0.1 - 4.9	**400**	0 - 400				
			600	0 - 600				

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Examples of standard part number product ordering

PTDVB2501B1C1
0 – 5 volt output transducer
250 bar maximum pressure
1/4" BSP with ED seal
Industrial micro-din 9.4mm connector

PTDSB4001B1C2
1 – 6 volt output transducer
400 bar maximum pressure
1/4" BSP with ED seal
M12 connector
(See accessories for IP68 protected cable)

PTXB0251B1C2
4 – 20mA output transmitter
25 bar maximum pressure
1/4" BSP with ED seal
M12 connector
(See accessories for IP68 protected cable)

A range of cost saving solutions

Flowmeters & Monitors

LoFlow - Oil and Water Flowmeters

Features & Benefits

- Easy to read, permanent printed scales.
- Large scale definition for precise measurement.
- Easy panel mounting assembly.
- Negligible pressure drop characteristics.
- 10 bar pressure rating.
- Simple to use.

Specification

Construction:

Body	Grillon TR55.
Back body half	ABS 7020.
Ball retainer	ABS 7020.
Back panel	PVC.
Float	See below.

Maximum working pressure:
10 bar.

Maximum working temperature:
60°C.

Accuracy:
±2% typical.

Repeatability:
±1%.

Connections:
1/4" and 3/4" tapered threads.

Installation Details

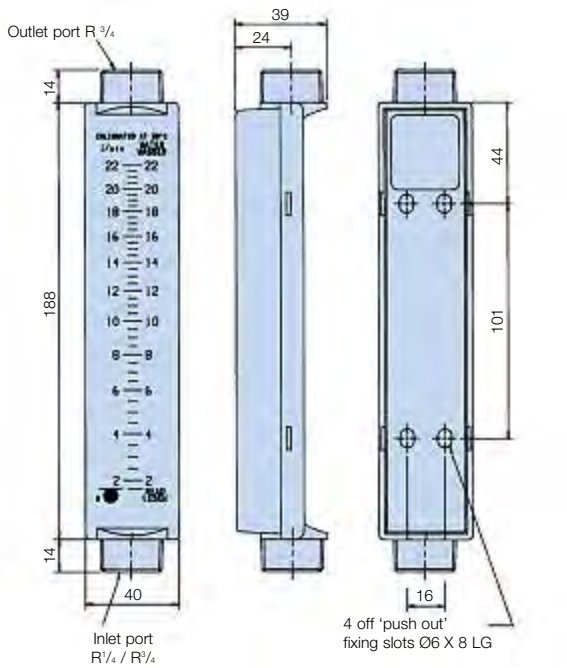
Simple to fit, easy to use

The LoFlow meter has been designed for those industries where the need exists for a low cost solution to small measurements of flow with an accurate reading. LoFlow uses the well tried and tested principle of variable area flow measurement utilising the movement of a ball or float inside a calibrated tapered bore.

Typical Applications

Pharmaceutical industry
Filtration systems
Hospital equipment
For water applications
Water treatment
Photography and X-ray Equipment
Swimming pools

Installation Details



Ordering Information

Standard products table

Product number	Supersedes	Media	Ports (BSPT male)	Flow range (l/min)	Float material
LF802412	LF.2020	Water	3/4 - 3/4	0.2 - 2.0	Acetal
LF802413	LF.2100	Water	3/4 - 3/4	2.0 - 10.0	S/Steel
LF802414	LF.2220	Water	3/4 - 3/4	3.0 - 22.0	S/Steel
LF801431	LF.1002	Oil	1/4 - 3/4	0.010 - 0.20	S/Steel
LF802432	LF.1009	Oil	3/4 - 3/4	0.1 - 0.9	Acetal
LF802434	LF.1090	Oil	3/4 - 3/4	1.0 - 9.0	S/Steel
LF801411	LF.2005	Water	1/4 - 3/4	0.06 - 0.55	S/Steel

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Easiflow - Meters and Flowswitches

Features & Benefits

- Oil and water calibrated.
- Works in any plane.
- Pressures up to 10 bar.
- Flows from 1 to 150 l/min.
- Accuracy ±5% FSD.
- Repeatability ±1% FSD.
- Switches – fully adjustable flow rate signalling.
- Plant and equipment protection.

Easiflow Meters Specification

Construction:

Cone	Acetal
Viewing glass	Borosilicate glass
Calibrated spring	Stainless steel
Seal	Nitrile
Body	Glass filled nylon

Maximum working pressure:
10 bar.

Minimum working pressure:
1 bar.

Temperature range:
+5°C to +80°C - Oil.
+5°C to +60°C - Water.

Flow rate:
1 to 150 l/min.

Viscosity range:
10 to 200 centistokes (oil).

Accuracy:
±5% FSD.

Repeatability:
±1% FSD.

Connections:
1" BSP parallel threads.

Weight:
0.4kg.

Flowswitch Specifications

The Easiflow switch is a flow measuring device incorporating an AC/DC switch suitable for controlling valves or pump motors or for activating alarm signals.

General flowmeter specification:
See material details opposite.

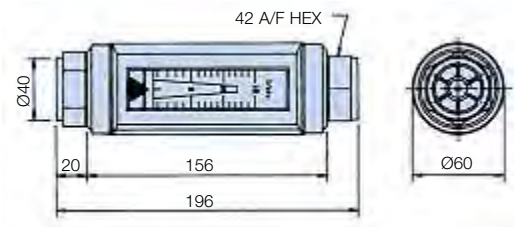
Switch type specifications:
Magnetically operated reed switch.

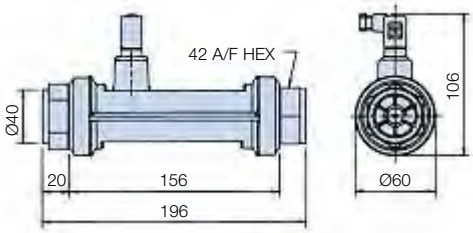
Electrical details:

Voltage range	300Vac/dc
Maximum current	2.5Amps
Maximum load	100W resistive 70W inductive

CE

Installation Details





Ordering Information

Standard products table

Product number	Supersedes	Media	Flow range (l/min)
EF7731111220	EFW.0302	Water	2 - 30
EF7731112220	EFW.0502	Water	4 - 50
EF7731113220	EFW.1002	Water	5 - 100
EF7731114220	EFW.1502	Water	10 - 150
EF7731110120	EFL.0151	Oil	1 - 15
EF7731111120	EFL.0301	Oil	2 - 30
EF7731112120	EFL.0501	Oil	4 - 50
EF7731113120	EFL.1001	Oil	5 - 100
EF7731114120	EFL.1501	Oil	10 - 150
EF7731110220	EFW.0152	Water	1 - 15

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Standard products table

Product number	Supersedes	Media	Flow range (l/min)	Switch range (l/min)
EF7731110221	EFW.015S1	Water	1 - 15	5 - 15
EF7731111221	EFW.030S1	Water	2 - 30	5 - 30
EF7731110121	EFL.015S1	Oil	1 - 15	5 - 15
EF7731111121	EFL.030S1	Oil	2 - 30	5 - 30
EF7731112121	EFL.050S1	Oil	4 - 50	10 - 50
EF7731113121	EFL.100S1	Oil	5 - 100	20 - 100
EF7731114121	EFL.150S1	Oil	10 - 150	30 - 150
EF7731112221	EFW.050S1	Water	4 - 50	10 - 50
EF7731113221	EFW.100S1	Water	5 - 100	20 - 100
EF7731114221	EFW.150S1	Water	10 - 150	30 - 150

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Dataflow - 4 to 20mA and Pulse Output Flow Transmitters

Features & Benefits

- 4 to 20mA output.
- Pulse output available for totalising/batching.
- Works in any plane.
- Accepts reverse flow.
- Maximum flow 150 l/min.
- Negligible pressure drop.
- Pressures up to 10 bar.
- Low cost. Simple to install.
- For use with most liquids.
- Factory calibrated. Accuracy ±2%.
- DIN 43650 plug connection (included).

Specification

Construction:
Borosilicate glasstube.
Nitrile seals.
Body – Glass filled nylon.
Rotor and locater – Acetal.
Washers and shaft – Stainless steel.
Rotor tips – Stainless steel.

Max. working pressure:
10 bar oil/water.

Flow indication:
Min: 2 l/min.
Max: 150 l/min.
Accepts reverse flow.

Accuracy:
±2% FSD.

Temp range:
+5°C to +80°C oil.
+5°C to +60°C water.

Connections:
1" BSP parallel threads.

Weight:
0.7Kg.

Calibration 4 to 20mA:
4mA = 0 l/min,
20mA = 100 l/min.

Calibration pulse output per litre:
'K' factors.
Oil = 51.14
Water = 44.25

CE

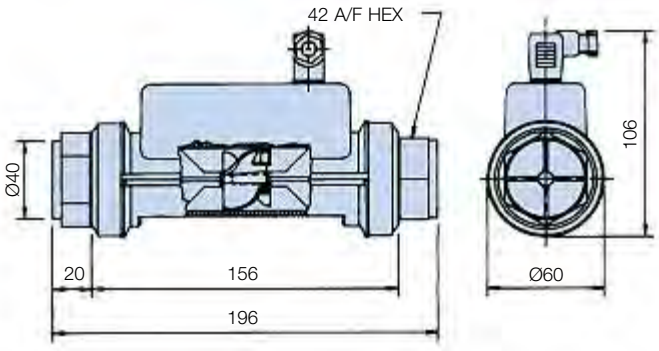
Electrical details 4 to 20mA:
Supply = 24Vdc.

Pulse output:
Supply = 24Vdc.
(open collector transistor).

Digital Display Specification (DFT 990 only)

For indicator options please refer to MS150 section of the catalogue, reference DDU1001 and DDU1002 indicators

Installation Details



Ordering Information

Standard products table

Product number	Supersedes	Description
DFT980	DFT.980	Dataflow "Pulse" output transmitter
DFT990	DFT.990	Dataflow 4-20mA transmitter

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Dataflow 4-20mA transmitter can be connected to a Digital Display Unit (DDU1001 or DDU1002)

4 to 20mA On-Site Calibration

Set your system to zero flow. Connect a multimeter across terminals 1 (+20mA) and ⏚ (0mA) (Dia. 2). Set the zero to read 4mA on your multimeter (Dia. 1). Set your system to full flow and set the span to read 20mA on your multimeter. (Dia. 1)

Note: Minimum span setting = 30 l/min

Diagram 1

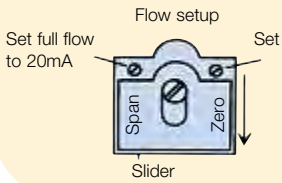
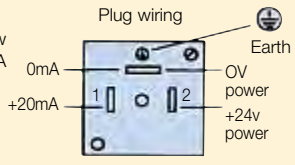


Diagram 2



Parker Hannifin
Hydraulic Filter Division Europe
FDHB200UK. Section 46

Dataflow Compact - Inline Flow Transmitter

Features & Benefits

- Pulse output signal for flows up to 25 l/min.
- Lightweight and robust.
- Operates in any plane. Simple to install.
- Low cost flow measurement.
- Negligible pressure drop.
- Accepts reverse flow.
- 3/8 BSP male connection.
- Water or compatible clear fluids only.
- Ideal for washing machines, showers and vending machines.

Specification

Construction:
Body Grilamid – TR55.
Rotor 18% PTFE filled nylon.
Shaft Stainless steel.
Shaft Retainers Grilamid TR55.

Operation:
Infra-red.

Maximum working pressure:
20 bar.

Pressure drop:
Max 0.1 bar at 15 l/min.

Flow range:
1 to 25 l/min.
(Accepts reverse flow).

Calibration:
'K' Factor 752 pulses per litre, typical.
Subject to application.

Accuracy:
±2% typical.

Repeatability:
±1%.

Temperature range:
+5°C to +70°C.

Overall dimensions:
52mm x 29mm x 27mm.

Weight:
16 grams.

Connections:
3/8 BSP

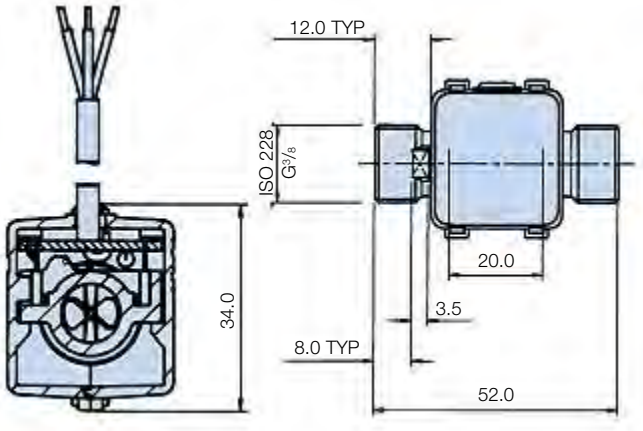
Cable length:
300mm.

Power supply:
5 Vdc.

Output signal:
5 Vdc - square wave

Installation Details

Red wire +5V supply
Green wire Output signal
Blue wire 0V supply



Dataflow Compact – The Low Cost Transmitter

The Dataflow Compact Transmitter was designed to offer OEM's and end users alike a means of monitoring low flows on liquids with an electronic output signal – but at LOW COST. Fluid passes through the one piece sensor body impacting on the twin vaned turbine rotor, causing it to rotate at a speed proportional to the flow rate. Two opposing photo-transistors are mounted either side of the rotor and externally of the clear sensor body, these generate a continuous signal.

As the rotor spins each blade obscures the infra red signal. This is then converted into an industry standard pulse output signal – compatible with inexpensive display units for flow rate, totalising, batch control and large, central control systems. The lightweight Grilamid body with its virtually unrestricted flow path, offers negligible pressure drop for flows up to 25 l/min and withstanding pressures up to 20 bar.

Flow Rate • Totalising • Batch Control and applications in many industries

Dataflow Compact Transmitters are small and very robust having been developed and tested extensively in industry applications where space is a restriction. Dataflow Compact with its Grilamid body and BSP connections can be installed almost anywhere and once installed will give accurate and reliable output signalling.

Ordering Information

Standard products table

Product number	Supersedes	Description
DFC9000100	DFC.9000100	Dataflow compact transmitter

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Flowline - Oil and Water Calibrated Flowmeters (Brass Version)

Features & Benefits

- Works in any plane.
- Pressure up to 350 bar (5000 psi).
- Flows up to 360 l/min.
- Accuracy ±5% FSD.
- Repeatability ±1% FSD.
- Direct reading.
- Relatively insensitive to viscosity changes.
- Oil or water calibrated.
- Optional reed switch upgrade.

Specification

Construction:
Brass body to BS 2874 CZ114.

Maximum working pressure:
Up to 350 bar.

Minimum working pressure:
1 bar.

Temperature range:
Brass –20°C to +90°C.

Calibration:
Oil Specific gravity 0.856 at 20°C.
Water Specific gravity 1.0 at 20°C.

Viscosity range:
10 to 200 cSt (oil).

Accuracy:
±5% FSD.

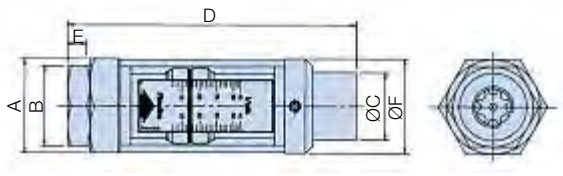
Repeatability:
±1% FSD.

Min. scale reading:
10% FSD.

Connections:
BSP parallel threads.

Wetted/non-wetted parts:
Consult Parker for information.

1/4", 1/2" and 3/4" BSP thread options



Note: To add an electrically operated reed switch to your flowmeter please order B.26307

Ordering Information - Oil

Standard products table

Brass flowmeter for oil					Dimensions (mm)						
Product number	Supersedes	Ports BSP	Flow range (l/min)	Maximum pressure (bar)	A (A/F Hex)	B (A/F Hex)	C	D	E	F	Weight (kg)
FM26122212	FM.26 122 212	1/4	0.5 - 4.5	350	32	29	19	123	7	32	0.4
FM26122312	FM.26 122 312	1/4	1 - 9	350	32	29	19	123	7	32	0.4
FM26222112	FM.26 222 112	1/2	2 - 20	350	41	38	32	165.5	12.5	46	0.9
FM26222212	FM.26 222 212	1/2	5 - 46	350	41	38	32	165.5	12.5	46	0.9
FM26322112	FM.26 322 112	3/4	5 - 55	350	58	46	43	190	15	58	1.75
FM26322212	FM.26 322 212	3/4	10 - 110	350	58	46	43	190	15	58	1.75
FM26122112	FM.26 122 112	1/4	0.2 - 2.0	350	32	29	19	123	7	32	0.4
FM26422112	FM.26 422 112	1 1/4	20 - 180	210	For intallation details for 1 1/4 flowmeters see next page						8.0
FM26422212	FM.26 422 212	1 1/4	30 - 270	210							8.0
FM26422312	FM.26 422 312	1 1/4	40 - 360	210							8.0

Ordering Information - Water

Standard products table

Brass flowmeter for water					Dimensions (mm)						
Product number	Supersedes	Ports BSP	Flow range (l/min)	Maximum pressure (bar)	A (A/F Hex)	B (A/F Hex)	C	D	E	F	Weight (kg)
FM26222122	FM.26 222 122	1/2	2 - 20	350	41	38	32	165.5	12.5	46	0.9
FM26222222	FM.26 222 222	1/2	5 - 46	350	41	38	32	165.5	12.5	46	0.9
FM26322122	FM.26 322 122	3/4	5 - 55	350	58	46	43	190	15	58	1.75
FM26322222	FM.26 322 222	3/4	10 - 110	350	58	46	43	190	15	58	1.75
FM26122122	FM.26 122 122	1/4	0.2 - 2.0	350	32	29	19	123	7	32	0.4
FM26122222	FM.26 122 222	1/4	0.5 - 4.5	350	32	29	19	123	7	32	0.4
FM26122322	FM.26 122 322	1/4	1 - 9	350	32	29	19	123	7	32	0.4
FM26422122	FM.26 422 122	1 1/4	20 - 180	210	For intallation details for 1 1/4 flowmeters see next page						8.0
FM26422222	FM.26 422 222	1 1/4	30 - 270	210							8.0
FM26422322	FM.26 422 322	1 1/4	40 - 360	210							8.0

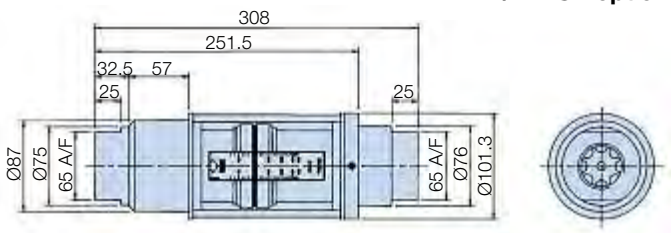
Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Flowline - Oil and Water Calibrated Flowmeters (Stainless Steel)

Features & Benefits

- For flow measurement of corrosive or chemical media or in harsh locations.
- Manufactured in stainless steel 316.
- Works in any plane.
- Pressure up to 350 bar (5000 psi).
- Flows up to 360 l/min.
- Accuracy ±5% FSD.
- Repeatability ±1% FSD.
- Direct reading.
- Oil or water calibrated.
- Optional reed switch upgrade.

1¼" BSP option



Specification

Construction:
Stainless steel to BS 970 316S.

Maximum working pressure:
Up to 350 bar.

Minimum working pressure:
1 bar.

Temperature range:
–20°C to +105°C.

Calibration:
Oil Specific gravity 0.856 at 20°C.
Water Specific gravity 1.0 at 20°C.

Viscosity range:
10 to 200 cSt (oil).

Accuracy:
±5% FSD.

Repeatability:
±1% FSD.

Min. scale reading:
10% FSD.

Connections:
BSP parallel threads.

Wetted parts:
Body, thread adaptor

Piston, etc: cone locknut:
Stainless Steel.

Flow cone:
BS 970 316S 16.

Magnet encapsulation:
Stainless steel BS970/1:1991. :316S31.

Spring:
Stainless steel to BS 2056 EN 58J.

Seal:
Viton.

Note: To add an electrically operated reed switch to your flowmeter please order B.26307

Ordering Information - Oil

Standard products table

Stainless steel flowmeter for oil					Dimensions (mm)						
Product number	Supersedes	Ports BSP	Flow range (l/min)	Maximum pressure (bar)	A (A/F Hex)	B (A/F Hex)	C	D	E	F	Weight (kg)
FM26232112	FM.26 232 112	½	2 - 20	350	41	38	32	165.5	12.5	46	0.9
FM26332112	FM.26 332 112	¾	5 - 55	350	58	46	43	190	15	58	1.75
FM26332212	FM.26 332 212	¾	10 - 110	350	58	46	43	190	15	58	1.75
FM26132112	FM.26 132 112	¼	0.2 - 2.0	350	32	29	19	123	7	32	0.4
FM26132212	FM.26 132 212	¼	0.5 - 4.5	350	32	29	19	123	7	32	0.4
FM26132312	FM.26 132 312	¼	1 - 9	350	32	29	19	123	7	32	0.4
FM26232212	FM.26 232 212	½	5 - 46	350	41	38	32	165.5	12.5	46	0.9
FM26432112	FM.26 432 112	1¼	20 - 180	350	For intallation details for 1¼ flowmeters see above						8.0
FM26432212	FM.26 432 212	1¼	30 - 270	350							8.0
FM26432312	FM.26 432 312	1¼	40 - 360	350							8.0

Ordering Information - Water

Standard products table

Stainless steel flowmeter for water					Dimensions (mm)						
Product number	Supersedes	Ports BSP	Flow range (l/min)	Maximum pressure (bar)	A (A/F Hex)	B (A/F Hex)	C	D	E	F	Weight (kg)
FM26132122	FM.26 132 122	¼	0.2 - 2.0	350	32	29	19	123	7	32	0.4
FM26132222	FM.26 132 222	¼	0.5 - 4.5	350	32	29	19	123	7	32	0.4
FM26132322	FM.26 132 322	¼	1 - 9	350	32	29	19	123	7	32	0.4
FM26232122	FM.26 232 122	½	2 - 20	350	41	38	32	165.5	12.5	46	0.9
FM26232222	FM.26 232 222	½	5 - 46	350	41	38	32	165.5	12.5	46	0.9
FM26332122	FM.26 332 122	¾	5 - 55	350	58	46	43	190	15	58	1.75
FM26332222	FM.26 332 222	¾	10 - 110	350	58	46	43	190	15	58	1.75
FM26432122	FM.26 432 122	1¼	20 - 180	350	For intallation details for 1¼ flowmeters see above						8.0
FM26432222	FM.26 432 222	1¼	30 - 270	350							8.0
FM26432322	FM.26 432 322	1¼	40 - 360	350							8.0

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Flowline - Flowswitches

Features & Benefits

- ‘Boxed’ two-switch type.
- Intrinsically safe versions.
- Maximum/minimum switching models.
- Maximum working pressure 350 bar. (min 1 bar)
- Flows from 2.0 to 110 l/min.
- Stainless steel – suitable for corrosive media.
- Stainless steel to BS970 316S16.

Ordering Information

To order the required switching unit, simply add the appropriate prefix before the part numbers shown below.

Standard products table

Product number	Supersedes	Description
FS643222112	FS.643 222 112	2 switches, 2 - 20 l/min (1/2 BSP) Oil
FS643222212	FS.643 222 212	2 switches, 5 - 46 l/min (1/2 BSP) Oil
FS643322112	FS.643 322 112	2 switches, 5 - 55 l/min (1/2 BSP) Oil
FS643322212	FS.643 322 212	2 switches, 10 - 110 l/min (1/2 BSP) Oil

Product configurator

Brass flowswitch for oil or water		Flow range and (port size)		Fluid type	
Product number					
FS643	2 switches	**2221**	2 - 20 l/min (1/2 BSP)	**12**	Oil
FS67A	Intrinsically safe high switch	**2222**	5 - 46 l/min (1/2 BSP)	22	Water
FS67B	Intrinsically safe low switch	**3221**	5 - 55 l/min (3/4 BSP)		
FS67C	Intrinsically safe hi/low switch	**3222**	10 - 110 l/min (3/4 BSP)		

Product configurator

Stainless steel flowswitch for oil or water		Flow range and (port size)		Fluid type	
Product number					
FS643	2 switches	**2321**	2 - 20 l/min (1/2 BSP)	**12**	Oil
FS67A	Intrinsically safe high switch	**2322**	5 - 46 l/min (1/2 BSP)	**22**	Water
FS67B	Intrinsically safe low switch	**3321**	5 - 55 l/min (3/4 BSP)		
FS67C	Intrinsically safe hi/low switch	**3322**	10 - 110 l/min (3/4 BSP)		

Ordering example

Product number	Supersedes
FS643332212	**FS.643 332 212**

Note 1: Part numbers featured with bold highlighted codes will ensure a ‘standard’ product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Hydraulic Test Equipment

Features & Benefits

- Speedy diagnosis of hydraulic circuit faults.
- Flows ranging from 2 to 360 l/min.
- Measuring flow, pressure and temperature.
- Fully Portable – No power source required.
- Hydrotrac unit for flows from 2 to 110 l/min available.
- Designed for oil applications only.

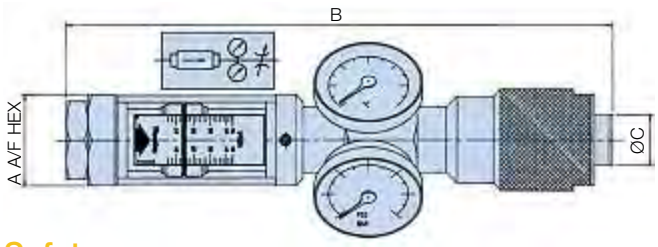
Specification

Flow range:
2 to 360 l/min.

Pressure range:
1 to 350 bar.

Temperature range:
0°C to +90°C.

Installation Details



Safety

An axial flow restrictor valve is fitted which can be adjusted under full load from open to fully closed, and to complete the specification, a safety blow-out disc, set to fail at 455 bar is fitted to the manifold in a position facing away from the operator when reading the gauges normally. Two spare blow-out discs are supplied which are easily replaced by removing the hexagonal plug on the gauge manifold.

Additional blow out discs can be ordered - 41203B (Bag of 10)

Troubleshooting Test Units

Hydraulic Test Units are designed specifically for the speedy diagnosis of hydraulic circuit faults in mobile, marine and industrial systems using the normal range of mineral oils. Their rugged construction based mainly on mild steel, manganese bronze and acrylic materials makes them ideally suited for arduous use in the field.

Each unit is supplied in a convenient carrying case providing full protection and additional storage space for fittings. Because they need no power source such as batteries etc, they are always ready for instant use.

6 models are available to cover flow capacities up to 360 l/min and each incorporates a direct reading, uni-directional flow meter. The meter, which is both self cleaning and reasonably tolerant of contaminated fluids is coupled to a manifold that houses a glycerine-filled pressure gauge calibrated 0 to 350 bar and a dial-type thermometer with a 0°C to 100°C range.

Unit can only operate up to 90°C.

For further convenience the scale on the flow meter can be rotated to ensure visibility in any situation and the installed attitude of the assembly is not critical, though whenever possible the unit should be mounted with pressure gauge vertical and gauge case relief valve uppermost. The unit is designed for flow to be in the direction of the arrow on the flowmeter scale and must not be installed with the flow reversed.

Ordering Information

Standard products table

Product number	Flow range (l/min)	Weight Kg (with case)	Dimensions (mm)		
			A	B	C
4121	10 - 110	7.4	46	350	35
4120	5 - 55	7.4	46	350	35
4123	2 - 110	11.8	46	350	35
4168	20 - 180	13.85	75	496	87
4169	30 - 270	13.85	75	496	87
4170	40 - 360	13.85	75	496	87

Part number	Supersedes	Description
41203B	4120.3.B	Safety blow out discs x 10

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.
Note 3: 4123 'Hydrotrac' unit features 2 flowmeters (2 - 20 and 10 - 110 l/min) and 1 pressure gauge and 1 thermometer.

Flow Products - For Compressed Air Applications

Features & Benefits

Ⓐ Flowline Flowswitches and Flowmeters

- Calibrated for direct reading of compressed air at 7 bar.
- Works in any plane.
- Brass or stainless steel models available in 4 sizes.
- Calibrated at 7 bar and 20°C.
- Flow ranges from 2 to 600 SCFM.
- Pressure 1-41 bar max.
- Optional reed switch upgrade.

Ⓑ Loflow Air Flowmeters

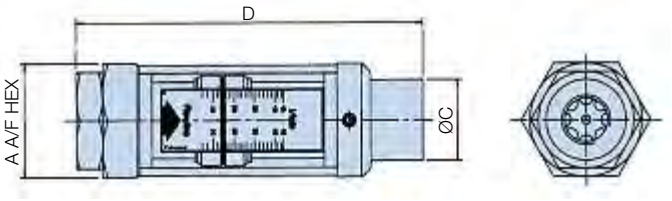
- Flow measurement from 1.1 to 720 l/min. Max 10 bar rating.

Ⓒ Compressed Air Test Equipment

- 6 models available – 1/4", 3/4" and 1 1/4" BSP.
- Air flow range 2 to 600 SCFM.
- Pressure 1-41 bar max.

Specification

Full technical specifications for the Flowmeter, Flowswitch, LoFlow and test equipment products are provided in the respective pages for these products.



Note: To add an electrically operated reed switch to your flowmeter please order B.26307

Ordering Information

Standard products table

Brass flowmeter for air		Ports BSP	Flow range		Maximum working pressure (bar)
Product number	Supersedes		SCFM	l/sec	
FM26123332	FM.26 123 332	1/4	2 - 20	1 - 10	41
FM26223132	FM.26 223 132	1/2	5 - 50	2 - 25	41
FM26223232	FM.26 223 232	1/2	10 - 110	5 - 50	41
FM26323132	FM.26 323 132	3/4	15 - 125	6 - 60	41
FM26323232	FM.26 323 232	3/4	20 - 225	10 - 100	41
FM26423132	FM.26 423 132	1 1/4	40 - 400	20 - 200	25
FM26423232	FM.26 423 232	1 1/4	60 - 600	30 - 300	25

Standard products table - LoFlow

Product number	Supersedes	Ports (BSPT male)	Flow range	Float material
LF801450	LF.3007E	1/4 - 3/4	1.1 - 8.0 l/min	Acetal
LF802455	LF.3050E	3/4 - 3/4	10 - 50 l/min	Acetal
LF802452	LF.3135E	3/4 - 3/4	20 - 135 l/min	Acetal
LF802454	LF.3720E	3/4 - 3/4	2 - 12 l/sec	S/Steel
LF801451	LF.3021E	1/4 - 3/4	4 - 22 l/min	S/Steel
LF802453	LF.3330E	3/4 - 3/4	1.0 - 5.5 l/sec	S/Steel

Standard products table

Stainless steel flowmeter for air		Ports BSP	Flow range		Maximum working pressure (bar)
Product number	Supersedes		SCFM	l/sec	
FM26133332	FM.26 133 332	1/4	2 - 20	1 - 10	41
FM26233132	FM.26 233 132	1/2	5 - 50	2 - 25	41
FM26233232	FM.26 233 232	1/2	10 - 110	5 - 50	41
FM26333132	FM.26 333 132	3/4	15 - 125	6 - 60	41
FM26333232	FM.26 333 232	3/4	20 - 225	10 - 100	41
FM26433132	FM.26 433 132	1 1/4	40 - 400	20 - 200	41
FM26433232	FM.26 433 232	1 1/4	60 - 600	30 - 300	41

Product configurator

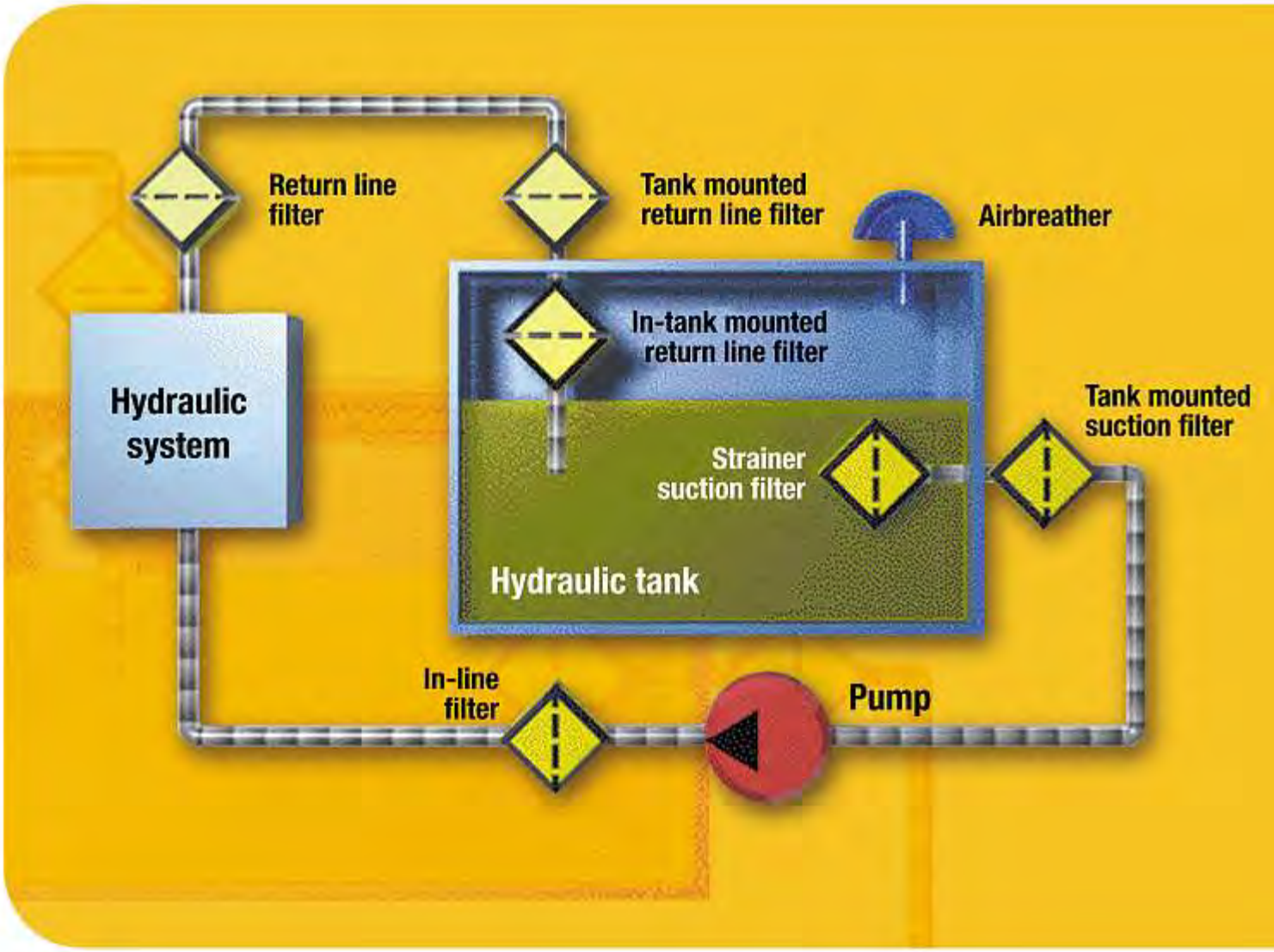
Brass flowswitch for air						
Product number		Flow range SCFM and (l/sec)		Ports (BSP)	Fluid type	
FS643	2 switches	2231	5 - 50 (2 - 25)	1/2	32	Air
FS67A	Intrinsically safe high switch	2232	10 - 110 (5 - 50)	1/2		
FS67B	Intrinsically safe low switch	3231	15 - 125 (6 - 60)	3/4		
		3232	20 - 225 (10 - 100)	3/4		

Ordering example

Product number	Supersedes
FS643323232	FS.643 323 232

Note 1: Part numbers featured with bold highlighted codes will ensure a 'standard' product selection.
Note 2: Alternate displayed part number selection will require you to contact Parker Filtration for availability.

Guide to Contamination Control



Guide to Contamination Control

The Threat of Contamination

Industry requirements with regard to hydraulic and oil lubrication systems emphasise reliability, long lifetime and reduced energy use. Depending on the circumstances, some 70 - 80% of system failures are due to contamination. Cleanliness monitoring is essential in contamination control, as is selecting the right filter components. The first step, however, is understanding the specific system requirements and local operating conditions.

This guide to contamination control describes:

- Types of failures
- Sources of contamination
- Fluid cleanliness level
- Condition monitoring equipment
- Cleanliness service
- Filtration: parameters and facts
- Filter selection and filter types

Types of Failures

Component failure is often an invisible process. In general three types of failure can be distinguished:

1. Catastrophic Failures

This failure occurs suddenly and without warning; it is of a permanent nature. It is often caused by larger sized particles entering a component and obstructing the relative movement between surfaces, resulting in seizure of the component.

2. Transient Failures

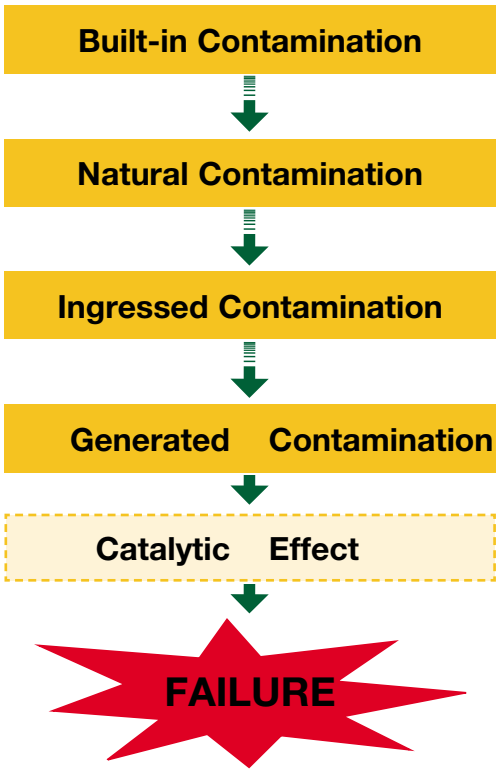
Generally speaking, this type of failure is short-lived and goes unnoticed, although the consequences rarely do. It is caused by particles that momentarily interfere with the function of a component. The particles lodge in a critical clearance between matching parts, only to be washed away during the next operation cycle. As a result, components become less predictable and thus unsafe.

3. Degradation Failures

Gradual deterioration in the performance of a component results in its eventual repair or replacement. This failure is caused by the effect of wear induced by contamination. Additional generated contamination can lead to a catastrophic failure. Failures or reduced system performance have a direct impact on the cost of ownership, the efficiency rate and the perceived quality perception of the end users.

Finding the balance

What does it take to implement system-matched filtration? A review of the sources of contamination is the first step in finding the balance between the performance of the filtration system and the system demands.



Sources of Contamination

Several sources of contamination must be taken into account when it comes to the effective implementation of system-matched filtration. Without adequate filtration, the protection of the system is jeopardised and component or system failure is imminent. System-matched filtration changes the deterioration into a balanced situation, representing the continuously controlled process that is needed to achieve system reliability. Realising this is only possible when the required fluid cleanliness levels are maintained.

1. Built-in Contamination

Residual contamination from the manufacturing and assembly processes cannot be avoided. Examples are machining debris, weld spatters, casting sand, paint, pipe sealant or fibres from cleaning rags. Flushing system components prior to assembly and decent housekeeping during the various stages of the assembly process are a must to reduce the amount of built-in contamination.

Filter media pleating

2. Natural Contamination

In general, the cleanliness level of new oil does not always meet the requirements of the system. Despite the efforts to control the fluid cleanliness level during the production processes, transport and distribution may contaminate the oil. Depending on the requirements for system cleanliness, we advise that you filter new oil before usage.

3. Ingressed Contamination

Systems are always under attack from contamination. Unfortunately it is not possible to avoid ingressed contamination. Air breathers, cylinder rod seals, wiper seals, component seals or poorly fitted covers are a few examples of system parts that may have an important influence on the amount of ingressed contamination.

4. Generated Contamination

Particles generate particles. This phenomenon is known as abrasion. Other processes like cavitation, corrosion, erosion, fatigue and metallic contact between moving parts generates particles and thus influences the contamination that is already present in the system. Even though these processes cannot always be avoided, their impact is strongly influenced by effective filtration.

5. Catalytic Effect

During the filter selection process, attention is generally given to the removal of solid, hard-type contamination only. The performance of hydraulic and lubrication fluids is influenced by the catalytic effect. As a result of the catalytic effect, the lifetime of the oil is significantly reduced.

Guide to Contamination Control

Lifetime of Oil

Selecting the Right Oil

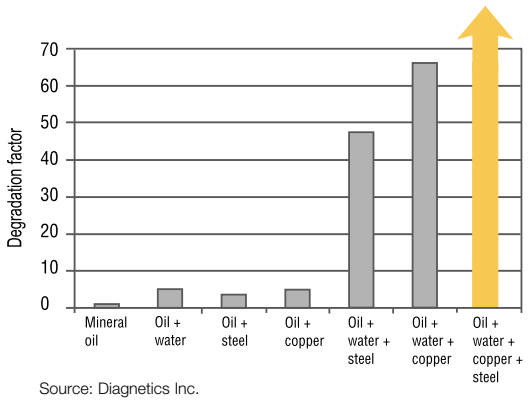
Oils are selected based on their unique performance with regard to:

a. Energy transfer
b. Corrosion protection
c. Cooling (transfer of heat)
d. Lubrication

The lifetime of oils is influenced by the amount of oxygen, oil temperature, water content and presence of catalyser type elements. The allowed water content varies for each type of oil. Due to, for example, seal leakage or condensation, the water content can easily reach concentrations far above the allowed water content value. The combination of water and wear elements like iron or copper causes a catalytic effect and as a result, reduces the lifetime of the oil. The lifetime of oil is also influenced by the amount of generated static electrics.

Lifetime Reduction

The lifetime reduction of oil is expressed by the degradation factor. The influence of the catalytic effect of the degradation factor is shown below.



Source: Diagnetics Inc.

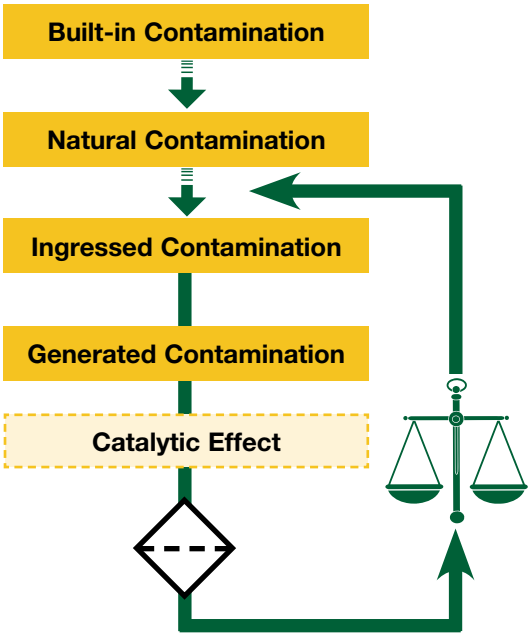
Oil degradation can reduce the protection against corrosion and lubrication performance.

Regular oil analysis is important to monitor the condition of the hydraulic or lubrication fluid. This analysis is also used to obtain information related to the process of selecting system-matched filter components.

Tanktopper II return line filter with integrated air breather and patented *LEIF*® element

The Balance between System Requirements and Filtration System Performance

Parker's philosophy exceeds the traditional approach of protecting the system by means of filtration.



System-matched filtration is not limited to a filter alone. The process of system-matched filtration is based on the correct implementation of suitable filtration products, taking into account the requirements from the hydraulic or lubrication fluids, system components and customer expectations.

Contamination Control

Achieving the required system protection implicates a correct understanding of the system. Today filters are selected based on several parameters like ß-values, pressure drop and dirt holding capacity.

Filtration is built-in safety, meant to achieve and maintain the required fluid cleanliness level during a defined period. This implicates a more detailed approach, which can only be realised when several filtration parameters are considered.

Before Filtration

After Filtration

Sizes of Contamination

Filters are selected to capture contamination from hydraulic and lubrication fluids.

Contamination is an invisible enemy. The human eye cannot see particles smaller than 40 micron. For the correct understanding a comparison is given below.

100 micrometers
Grain of salt

70 micrometers
Diameter of human hair

40 micrometers
Limit of visibility to the naked eye

25 micrometers
White blood cells

8 micrometers
Red blood cells

2 micrometers
Bacteria

Fluid Cleanliness Level

Component	Microns
Anti-friction bearings	0.5
Vane pump (vane tip to other ring)	0.5 - 1
Gear pump (gear to side plate)	0.5 - 5
Servo valves (spool to sleeve)	1 - 4
Hydrostatic bearings	1 - 25
Piston pump (piston to bore)	5 - 40
Servo valves flapper wall	18 - 63
Actuators	50 - 250
Servo valve orifice	130 - 450

Typical hydraulic component clearances are given as an indication only

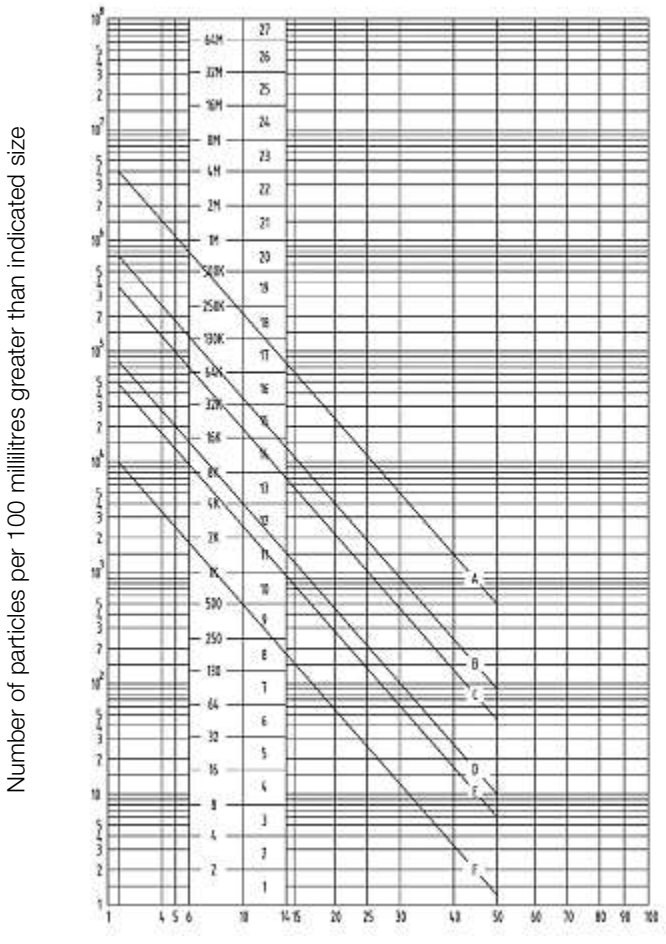
The ISO 4406:1999 standard is an important code to define the fluid cleanliness level using a solid contamination code.

This ISO code is determined by allocating a first scale number to the total number of particles larger than 4µm, allocating a second scale number to all particles larger than 6µm and allocating a third scale number to the total number of particles larger than 14µm.

In the recent past, the fluid cleanliness level code was determined using the ISO 4406:1987 standard. Instead of counting particles sizes 4, 6 and 14µm, the fluid cleanliness level was determined by counting particles larger than 5 and 15µm. The particle size 2µm was added later.

As a result of upgrading the ISO standards, new particle sizes have been defined. In general, the fluid cleanliness code will not change as a result of this new standard. Built-up historic data remains directly comparable to new data.

ISO 4406:1999 cleanliness classes



Guide to Contamination Control

Cleanliness Level

Examples of cleanliness level are given in the ISO graph. These lines represent:

A. Low-pressure systems (code 21/20/17)
B. Low-pressure control systems (code 19/18/14)
C. Sophisticated pumps/motors control valves (code 18/17/13)
D. Highly sophisticated systems and hydrostatic transmissions (code 16/15/11)
E. Sensitive servo systems (code 15/14/10)
F. High performance sensitive systems (code 12/11/8)

We recommend verifying the required cleanliness level based on the components used for the system. Manufacturers of system components often provide information related to the required fluid cleanliness level for their products.

Condition Monitoring Equipment

Over the years, fluid condition monitoring has become increasingly important. By offering system-matched filtration solutions, the stringent customer demands related to extended component lifetime or improved system reliability can be met. Parker has developed a complete range of instruments and components for maintenance programmes and local fluid condition analysis such as the LaserCM below.

LaserCM

Parker's particle counters are well known for their accurate performance in the field or in a production line environment. Lightweight portable particle counters can be used for temporary fluid cleanliness measurements.

The MCM20, designed for permanent installation, is meant for continuous fluid monitoring. The compact MS100 and MS150 moisture sensor together with the H_2Oil means a complete solution is available to measure the water content in hydraulic or lubrication fluids.

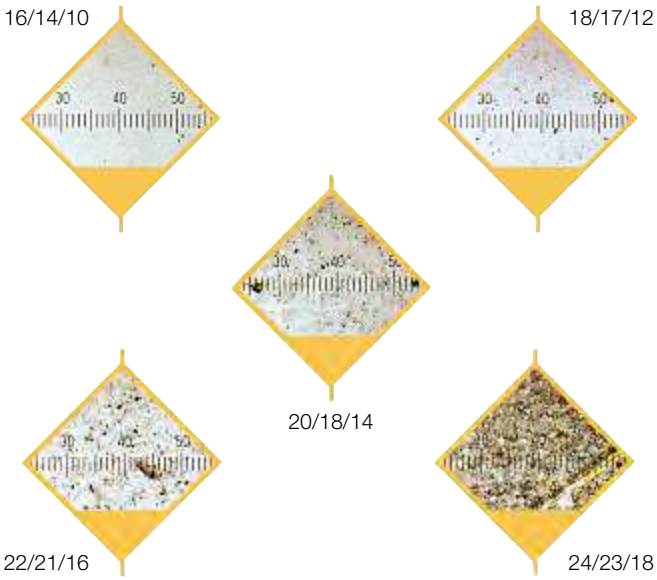
Solid Contaminant Codes

In addition to ISO 4406: 1999, other standards are used to express the fluid cleanliness level. A comparison between the codes is given below.

ISO 4406: 1999	ISO 4406: 1987	NAS 1638 CLASS
13/11/8	11/8	2
14/12/9	12/9	3
15/13/10	13/10	4
16/14/9	14/9	-
16/15/11	14/10	5
17/15/9	15/9	-
17/15/10	15/10	-
17/15/12	15/12	6
18/16/10	16/10	-
18/16/11	16/11	-
18/16/13	16/13	7
19/17/12	17/12	-
19/17/14	17/14	8
20/18/12	18/12	-
20/18/13	18/13	-
20/18/15	18/15	9
21/19/13	19/13	-
21/19/16	19/16	10
22/20/13	20/13	-
22/20/17	20/17	11

Note:
ISO 4406: 1987 is based on particle sizes larger than 5 and 15µm
ISO 4406: 1999 is based on particles sizes larger than 4, 6 and 14µm

Several Cleanliness Levels



Cleanliness Service to Prevent Failures

As Parker has no financial interest in the oil industry, the company can operate as an independent laboratory. The development laboratory at Parker Filtration BV in Arnhem - the only laboratory of its kind in Belgium, the Netherlands and Luxembourg - has at its disposal all the facilities for its extensive R & D department. In addition, the services are offered on a commercial basis to third parties.

Equipment

The laboratory uses state-of-the-art test equipment. The company has invested in the latest Karl Fischer coulometric equipment, that prevents tests from being influenced by, among other things, additives in the oil. The particle-counting equipment is calibrated according to the recent ISO 11171 standard. It is now possible to indicate the measured cleanliness according to ISO 4406:1999.

Standard Test

The high-quality standard test, carried out in Parker's laboratory, consists of a water analysis and a cleanliness calculation according to ISO 4406, the new ISO 4406:1999 and the NAS 1638 standard, as part of which particles from 2 to 100µm are measured and reported. Membrane research and digital photography of the membrane are also part of the standard test. The results of each test are described in a report that contains clear conclusions. It is also possible to conduct a spectral analysis.

In Practice

How do the laboratory services work? Only three days after receipt of the oil sample, the standard analysis is completed. The results of a spectral analysis are known after seven days. The reports can be sent directly and completely by e-mail. A free sample bottle is available upon request.

Filtration: Parameters and Facts

Generally speaking, fibre-type materials like cellulose and glass fibre are applied for hydraulic and lubrication fluid filtration. Filters are selected based on the following parameters:

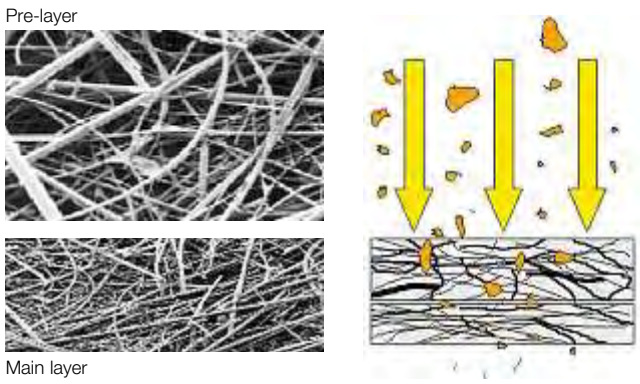
- Required protection of system components
- Location of filter(s) in the system
- Flow rate and allowed pressure loss
- Desired filter element life time
- Hydraulic or lubrication fluid type

The dirt holding capacity is the amount of solid contamination a filter can hold before the filter material is plugged. This value is measured in accordance to ISO 16889 using ISO MTD test dust. The filter element lifetime strongly depends on the contamination conditions that are present in the system and its environment.

Predicting the filter element lifetime in the system is complicated, because of the variety in contamination (e.g. metal, sand and fibres, each with a certain distribution of particle sizes) in relation to the specified dirt holding capacity.

Degree of Filtration

Parker's filtration philosophy is based on the optimum distribution of several particle sizes by using the complete thickness of glass fibre layers.

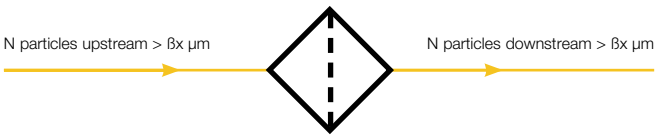


Each selected filter layer has a unique performance for the removal of solid contamination. System-matched filtration implicates the removal of harmful particles. For some systems an improved removal efficiency for smaller sized particles is more important compared to other systems using components. The combination of pre- and main layers results in an achievable fluid cleanliness level. The complete package of filter and support layers is indicated as pleat pack.

Guide to Contamination Control

Degree of Filtration

The ß-value is used to express the removal efficiency for a defined particle size.



ßx(c) = N particles upstream > x µm / N particles downstream > x µm

The ISO 4572 standard formerly required only the ßx>75 value. That standard has now been upgraded and replaced by ISO 16889, reporting the ß-value of 2, 10, 75, 100, 200 and 1000 for each filter medium or pleat pack. The corresponding efficiencies are given below.

ß-value	2	10	75	100	200	1000
Efficiency	50,00%	90,00%	98,67%	99,00%	99,50%	99,99%

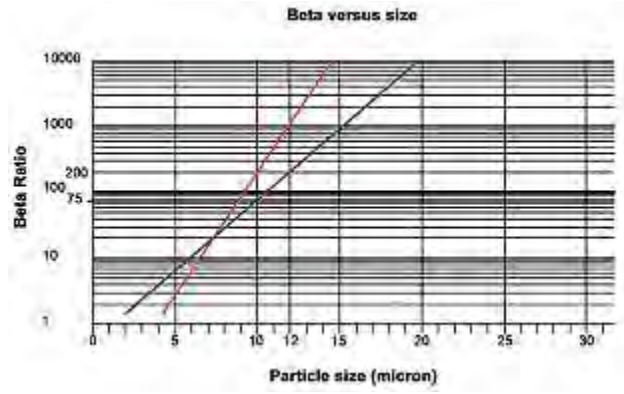
Taking into account a ß75(c)>10 element, the removal efficiency is 98.67% of particles larger than 10 micron.

Too often filter elements are compared by looking at one ß-value only. The focus on high ß-values is misleading and does not always provide the required information.

Comparison ß-value	Filter element I	Filter element II
Beta-value	ß-75(c)>10	ß-200(c)>10
Number of particles at upstream of filter >10 micron	5,000,000	5,000,000
Removal efficiency	98,67%	99,50%
Number of particles at downstream of filter >10 micron	66,500	25,000

Statements that a ß200 filter improves the fluid cleanliness level by a factor 2.6 (66,500/25,000) are misleading. Fluid cleanliness codes are based on several particle sizes. More information is needed to determine the overall removal performance of filter media.

A comparison between two 10-micron filter medias.

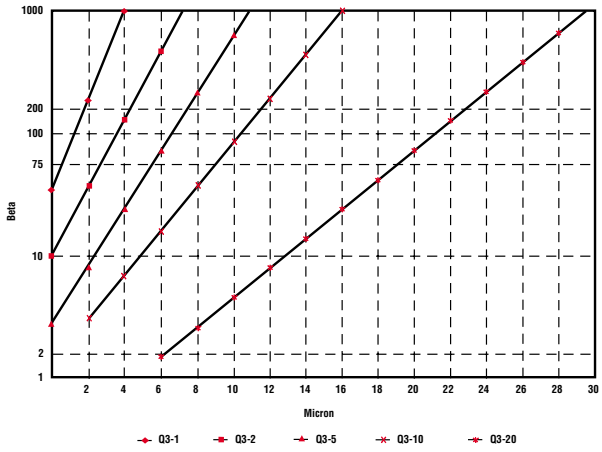


Filter element (blue) I: ß10(c)>75, Filter element (red) II: ß10(c)>200

Filter element II has a lower removal efficiency for smaller sized particles. Smaller sized particles can easily flow in narrow tolerances areas. Smaller sized particles will accelerate the amount of generated contamination, effecting the functionality of other system components and accelerating oil degradation.

The overall removal efficiency of the element forms the core of fluid cleanliness levels

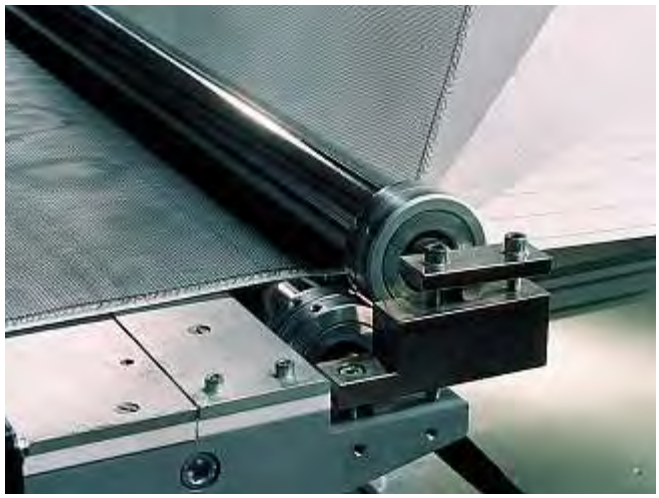
The correct degree of filtration is chosen based on the required fluid cleanliness level, not based on one ß-value.



An indication of recommended fluid cleanliness levels is given in this table. It is common use in the industry that manufacturers of components prescribe required fluid cleanliness level for the reliable functioning of their products.

Components	ISO Code
Servo control valves	16/14/11
Proportional valves	17/15/12
Valve & piston pumps/motors	18/16/13
Directional & pressure control valves	18/16/13
Gear pumps/motors	19/17/14
Flow control valves	20/18/15
Cylinders	20/18/15

The ISO codes are indicative values only.



Filter media composition

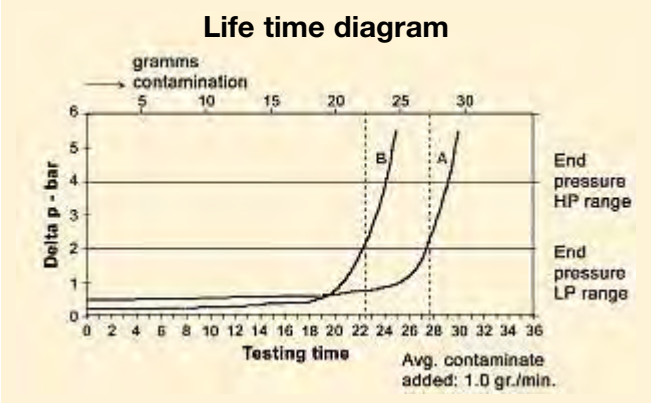
Flow Rate and Allowable Pressure Lost

Each filter element is designed to handle a nominal flow rate. The allowed flow rate depends on fluid viscosity, degree of filtration, and the amount of pressure that is lost. Indirectly, the required element lifetime is an important parameter. A larger sized element with a more effective filter element area has a positive influence on the element lifetime.

Media	Degree of filtration	Upper range	Lower range
Q3	3	16/14/10	13/11/8
Q3	6	18/16/13	17/15/9
Q3	10	20/18/15	19/17/12
Q3	20	22/20/17	21/19/13

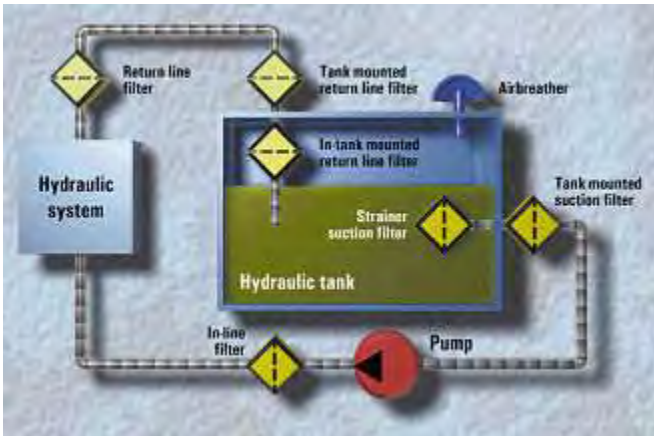
The given cleanliness levels are indicative values only, based on average values

Filter elements are chosen based on their initial clean element pressure drop. It is preferred to apply a ratio of at least three between element bypass settings and element initial pressure drops.


Life time diagram
gramms contamination
5 10 15 20 25 30
Delta p - bar
0 1 2 3 4 5 6
B
A
End pressure HP range
End pressure LP range
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36
Testing time
Avg. contaminate added: 1.0 gr./min.

Comparing filter elements with different filter media based on the initial clean element pressure drop does not give a reliable indication of the element dirt holding capacity. In this example the filter media A has a higher initial pressure drop. However, during its lifetime the pressure lost is more constant compared to media B. This results in a longer element lifetime. The difference in performance is caused by a more effective distribution of captured particles in media A.

Filter Types and Locations



Depending on the filter type and corresponding location, a general pressure lost recommendation can be given

Suction Line: 0.03-0.05 bar

Pressure Line: 1 bar

Return Line: 0.3-0.5 bar

Suction Return Filter: 1 bar

WARNING-USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

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Aerospace

Key Markets
- Commercial transports
- Military aircraft
- Regional transports
- Aircraft engines
- Business and general aviation

Key Products
- Flight control systems and components
- Hydraulic systems and components
- Fuel systems and components
- Pneumatic systems and components
- Inert oxygen generating systems
- Fluid metering, delivery and atomization devices
- Wheels and brakes
- Couplings, fittings, hoses and tubes

Automation

Key Markets
- Factory automation
- Transportation and automotive
- Life sciences and medical
- Machine tools
- Semiconductor and electronics

Key Products
- Pneumatic motion and control
- Air preparation
- Vacuum controls and sensors
- Electromechanical stepper and servo motors, drives, and controls
- Human machine interface
- Electric actuators, gantry robots, slides and linear motors
- Structural extrusion

Climate & Industrial Controls

Key Markets
- Refrigeration and air conditioning
- Transportation/mobile
- Process
- Industrial machinery
- Medical/life sciences
- Fuel cells
- Precision cooling

Key Products
- Pressure regulators
- Check, ball and service valves
- Value-added systems
- Thermostatic and expansion valves
- Electronic controllers
- Contaminant controls
- Heating/air conditioning hose
- Gerotors

Filtration

Key Markets
- Industrial machinery
- Process
- Mobile
- Marine
- Oil & gas
- Power generation and energy
- Transportation
- Food and beverage

Key Products
- Hydraulic, lubrication and coolant filters
- Process, chemical, water and microfiltration filters
- Compressed air and gas purification filters
- Condition monitoring
- Analytical gas generators
- Nitrogen, hydrogen and zero air generators
- Engine air, fuel, oil filtration and systems

Fluid Connectors

Key Markets
- Construction machinery
- Agriculture
- Transportation
- Mobile
- Industrial machinery
- Oil & gas

Key Products
- Rubber and thermoplastic hose
- Industrial hose
- Tube fittings and adaptors
- Tubing and plastic fittings
- Brass fittings and valves
- Hose couplings
- Quick disconnects

Hydraulics

Key Markets
- Construction machinery
- Agriculture
- Industrial machinery
- Oil & gas
- Truck hydraulics
- Power generation and energy

Key Products
- Hydraulic cylinders and accumulators
- Hydraulic valves and controls
- Hydraulic motors and pumps
- Power take-offs
- Hydraulic systems

Instrumentation

Key Markets
- Power generation
- Oil & gas
- Petrochemical
- Microelectronics
- Biopharmaceutical

Key Products
- Medium/high pressure fittings and valves
- Instrumentation fittings, valves, manifolds and regulators
- High purity fittings, valves and regulators
- Fluoropolymer fittings, valves, pumps and regulators
- Analytical systems

Seal

Key Markets
- Transportation
- Energy, oil & gas
- Semiconductor
- Aerospace
- Fluid power
- Life sciences
- Telecommunications

Key Products
- Elastomeric O-rings
- Homogeneous and inserted elastomeric shapes and diaphragms
- Metal and plastic retained composite seals
- Polymeric and plastic dynamic seals
- Rubber and plastic boots/bellows
- Extruded and precision-cut/fabricated elastomeric seals
- Thermoplastic engineered seals

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